Computer algebra independent integration tests

3-Logarithms/3.2.2-f+g-x-^m-h+i-x-^q-A+B-log-e-a+b-x-over-c+d-x-^n-^p

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Contents

Chapter 1

Introduction

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

The number of integrals in this report is [263]. This is test number [60].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

1. Mathematica 12.1 (64 bit) on windows 10.
2. Rubi 4.16.1 in Mathematica 12 on windows 10.
3. Maple 2020 (64 bit) on windows 10.
4. Maxima 5.43 on Linux. (via sagemath 8.9)
5. Fricas 1.3.6 on Linux (via sagemath 9.0)
6. Sympy 1.5 under Python 3.7.3 using Anaconda distribution.
7. Giac/Xcas 1.5 on Linux. (via sagemath 8.9)

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

Sympy was called directly using Python.

1.2 Results

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

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

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

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

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

System	solved	Failed
Rubi	% 94.68 (249)	% 5.32 (14)
Mathematica	% 94.68 (249)	% 5.32 (14)
Maple	% 37.26 (98)	% 62.74 (165)
Maxima	% 68.06 (179)	% 31.94 (84)
Fricas	% 59.32 (156)	% 40.68 (107)
Sympy	% 18.63 (49)	% 81.37 (214)
Giac	% 18.63 (49)	% 81.37 (214)

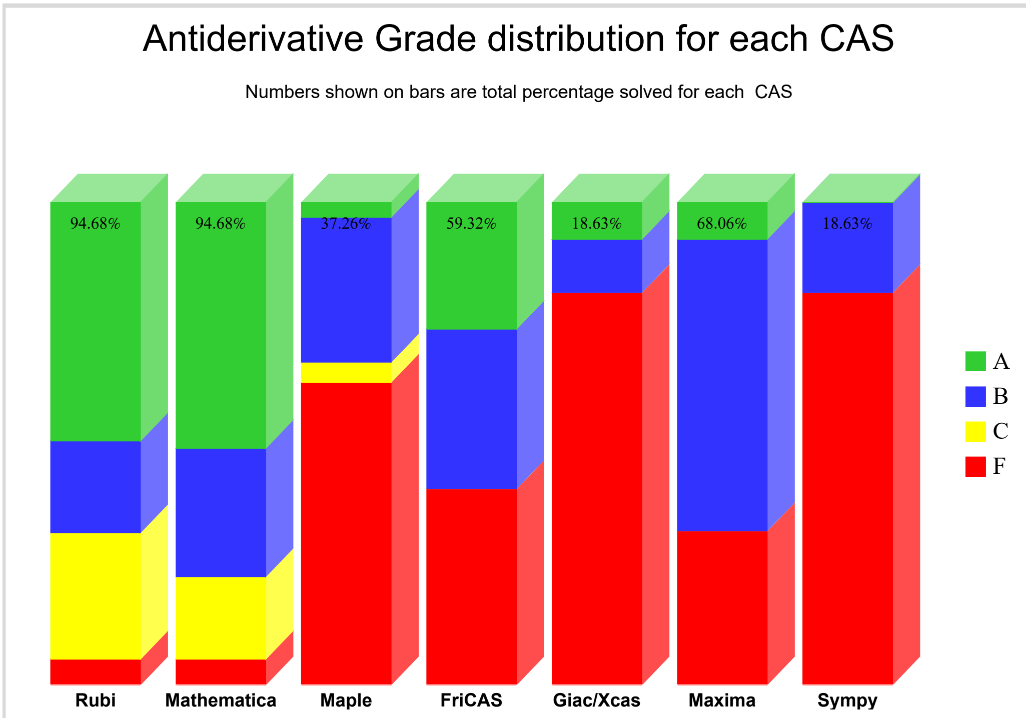
The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives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

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

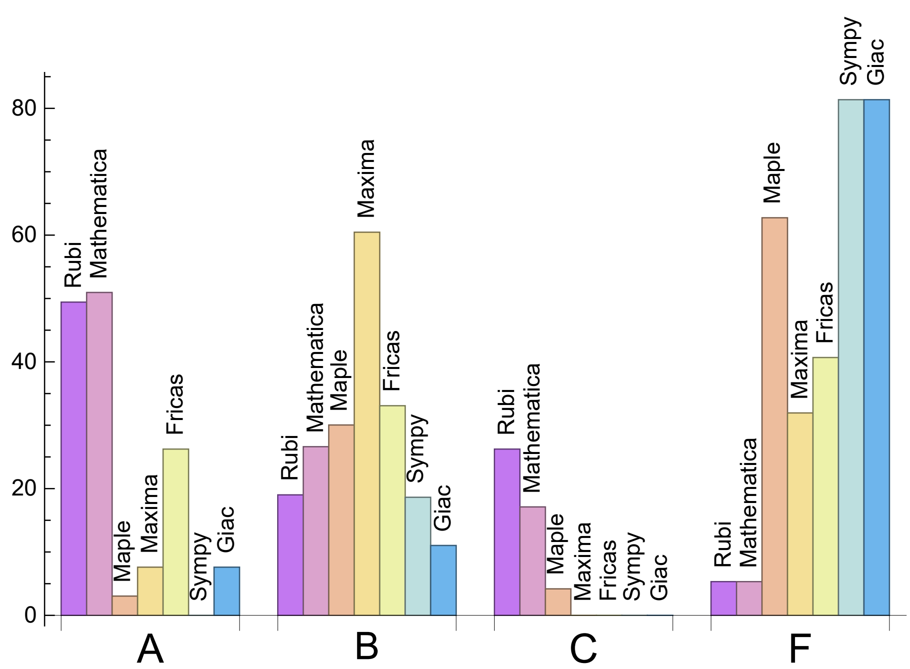
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	49.43	19.01	26.24	5.32
Mathematica	50.95	26.62	17.11	5.32
Maple	3.04	30.04	4.18	62.74
Maxima	7.6	60.46	0.	31.94
Fricas	26.24	33.08	0.	40.68
Sympy	0.	18.63	0.	81.37
Giac	7.6	11.03	0.	81.37

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



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



1.3 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	2.14	697.39	2.33	462.	1.6
Mathematica	1.58	873.11	2.53	362.	1.24
Maple	0.68	2692.94	24.99	1456.	6.25
Maxima	2.23	2947.9	9.66	1871.	6.51
Fricas	0.65	1369.64	5.01	943.	4.31
Sympy	26.6	1111.27	4.36	889.	4.29
Giac	2.44	418.96	3.13	298.	3.08

1.4 list of integrals that has no closed form antiderivative

{253, 254, 262, 263}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

The percentage of such failures were not counted for each test file, but for an example, for the Timofeev test file, there were about 30 such integrals out of total 705, or about 4 percent. This pecrentage can be higher or lower depending on the specific input test file.

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. If the output was an exception `ValueError` then this is most likely due to this reason.

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

The other CAS systems (SageMath and Sympy) do not have special buildin function for this purpose at this time. Therefore the leaf size is determined as follows.

For Fricas, Giac and Maxima (all called via sagemath) the following code is used

```
#see https://stackoverflow.com/questions/25202346/how-to-obtain-leaf-count-expression-size-in-s

def tree(expr):
    if expr.operator() is None:
       return expr
    else:
       return [expr.operator()]+map(tree, expr.operands())

try:
    # 1.35 is a fudge factor since this estimate of leaf count is bit lower than
    #what it should be compared to Mathematica's
    leafCount = round(1.35*len(flatten(tree(anti))))
except Exception as ee:
    leafCount =1
```

For Sympy, called directly from Python, the following code is used

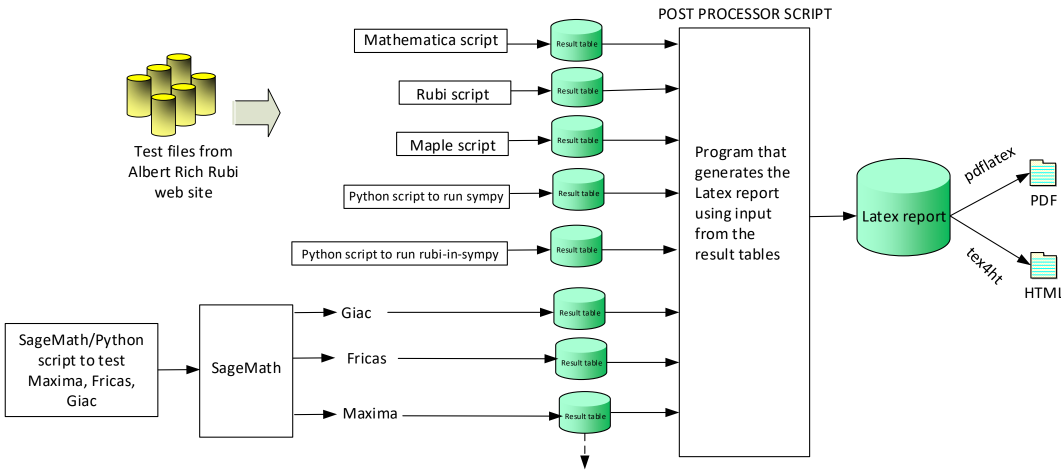
```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  except Exception as ee:
         leafCount =1
```

When these cas systems have a buildin function to find the leaf size of expressions, it will be used instead, and these tests run again.

1.10 Design of the test system

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



One record (line) per one integral result. The line is CSV comma separated. It contains 13 fields. This is description of each record (line)

1. integer, the problem number.
2. integer. 0 or 1 for failed or passed. (this is not the grade field)
3. integer. Leaf size of result.
4. integer. Leaf size of the optimal antiderivative.
5. number. CPU time used to solve this integral. 0 if failed.
6. string. The integral in Latex format
7. string. The input used in CAS own syntx.
8. string. The result (antiderivative) produced by CAS in Latex format
9. string. The optimal antiderivative in Latex format.
10. integer. 0 or 1. Indicates if problem has known antiderivative or not
11. String. The result (antiderivative) in CAS own syntax.
12. String. The grade of the antiderivative. Can be “A”, “B”, “C”, or “F”
13. String. The optimal antiderivative in CAS own syntax.

High level overview of the CAS independent integration test build system

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June 22, 2018

Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 32, 33, 34, 39, 40, 41, 42, 47, 48, 50, 55, 56, 58, 64, 65, 66, 67, 74, 75, 76, 77, 108, 109, 111, 112, 113, 115, 116, 117, 118, 119, 120, 121, 122, 123, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 143, 144, 145, 146, 151, 152, 154, 159, 160, 162, 168, 169, 170, 171, 178, 179, 180, 181, 214, 220, 224, 225, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 251, 252, 253, 254, 255, 256, 257, 258, 260, 261, 262, 263 }

B grade: { 3, 7, 17, 28, 29, 49, 57, 59, 60, 68, 69, 70, 78, 79, 80, 84, 85, 86, 87, 92, 93, 94, 100, 101, 110, 114, 124, 153, 161, 163, 164, 172, 173, 174, 182, 183, 184, 185, 186, 187, 188, 189, 194, 195, 196, 202, 203, 249, 250, 259 }

C grade: { 35, 36, 37, 38, 43, 44, 45, 46, 51, 52, 53, 54, 61, 62, 63, 71, 72, 73, 81, 82, 83, 88, 89, 90, 91, 95, 96, 97, 98, 99, 102, 103, 104, 105, 106, 107, 139, 140, 141, 142, 147, 148, 149, 150, 155, 156, 157, 158, 165, 166, 167, 175, 176, 177, 190, 191, 192, 193, 197, 198, 199, 200, 201, 204, 205, 206, 207, 208, 209 }

F grade: { 210, 211, 212, 213, 215, 216, 217, 218, 219, 221, 222, 223, 226, 227}

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 33, 34, 39, 40, 41, 42, 47, 48, 50, 55, 56, 58, 65, 66, 67, 75, 76, 77, 87, 88, 89, 90, 91, 96, 97, 98, 99, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 117, 118, 119, 120, 121, 122, 123, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 143, 144, 145, 146, 151, 152, 154, 159, 160, 162, 169, 170, 171, 179, 180, 181, 190, 212, 213, 214, 218, 219, 220, 224, 225, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 241, 242, 243, 244, 245, 246, 247, 248, 253, 254, 262, 263 }

B grade: { 7, 17, 18, 28, 29, 30, 49, 57, 59, 60, 64, 68, 69, 70, 74, 78, 79, 80, 84, 85, 86, 92, 93, 94, 100, 101, 114, 124, 125, 153, 161, 163, 164, 168, 172, 173, 174, 178, 182, 183, 184, 185, 186, 187, 188, 189, 191, 192, 193, 194, 195, 196, 198, 199, 200, 201, 202, 203, 206, 207, 208, 209, 251, 252, 255, 256, 257, 258, 260, 261 }

C grade: { 35, 36, 37, 38, 43, 44, 45, 46, 51, 52, 53, 54, 61, 62, 63, 71, 72, 73, 81, 82, 83, 95, 102, 103, 139, 140, 141, 142, 147, 148, 149, 150, 155, 156, 157, 158, 165, 166, 167, 175, 176, 177, 197, 204, 205 }

F grade: { 210, 211, 215, 216, 217, 221, 222, 223, 226, 227, 240, 249, 250, 259}

2.1.3 Maple

A grade: { 253, 254, 255, 256, 257, 258, 262, 263 }

B grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 61, 62, 63, 71, 72, 73, 81, 82, 83, 87, 88, 89, 90, 91, 95, 96, 97, 98, 99, 102, 103, 104, 105, 106, 107 }

C grade: { 228, 229, 230, 231, 232, 233, 237, 238, 239, 252, 261 }

F grade: { 55, 56, 57, 58, 59, 60, 64, 65, 66, 67, 68, 69, 70, 74, 75, 76, 77, 78, 79, 80, 84, 85, 86, 92, 93, 94, 100, 101, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 234, 235, 236, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 259, 260 }

2.1.4 Maxima

A grade: { 4, 5, 14, 33, 42, 50, 111, 112, 146, 154, 231, 232, 237, 238, 239, 245, 253, 254, 262, 263

B grade: { 1, 2, 3, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 49, 51, 52, 53, 54, 55, 56, 57, 58, 61, 62, 63, 64, 65, 66, 67, 71, 72, 73, 74, 75, 76, 77, 81, 82, 88, 89, 90, 91, 95, 96, 97, 98, 99, 102, 103, 104, 105, 106, 107, 108, 109, 110, 114, 115, 116, 117, 118, 119, 120, 121, 122, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 135, 136, 137, 139, 140, 141, 142, 143, 144, 147, 148, 149, 150, 151, 153, 155, 156, 157, 158, 159, 160, 161, 162, 165, 166, 167, 168, 169, 170, 171, 175, 176, 177, 178, 179, 180, 181, 190, 191, 192, 193, 197, 198, 199, 200, 201, 204, 205, 206, 207, 208, 209, 228, 229, 230, 233, 255, 256, 257, 258 }

C grade: { }

F grade: { 6, 16, 27, 34, 41, 48, 59, 60, 68, 69, 70, 78, 79, 80, 83, 84, 85, 86, 87, 92, 93, 94, 100, 101, 113, 123, 134, 138, 145, 152, 163, 164, 172, 173, 174, 182, 183, 184, 185, 186, 187, 188, 189, 194, 195, 196, 202, 203, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 234, 235, 236, 240, 241, 242, 243, 244, 246, 247, 248, 249, 250, 251, 252, 259, 260, 261 }

2.1.5 FriCAS

A grade: { 3, 4, 10, 11, 12, 22, 35, 36, 37, 38, 42, 43, 44, 45, 50, 51, 52, 89, 90, 91, 95, 96, 97, 98, 103, 104, 105, 139, 140, 141, 146, 147, 148, 154, 155, 197, 198, 215, 216, 220, 221, 222, 224, 225, 230, 231, 232, 234, 235, 236, 237, 238, 239, 241, 242, 243, 244, 245, 246, 247, 248, 253, 254, 255, 256, 257, 258, 262, 263 }

B grade: { 1, 2, 7, 8, 9, 13, 17, 18, 19, 20, 21, 23, 28, 29, 30, 46, 49, 53, 54, 61, 62, 63, 71, 72, 73, 81, 82, 83, 88, 99, 102, 106, 107, 108, 109, 110, 111, 114, 115, 116, 117, 118, 119, 120, 124, 125, 126, 127, 128, 129, 130, 142, 149, 150, 153, 156, 157, 158, 165, 166, 167, 175, 176, 177, 190, 191, 192, 193, 199, 200, 201, 204, 205, 206, 207, 208, 209, 212, 213, 214, 217, 218, 219, 223, 228, 229, 233 }

C grade: { }

F grade: { 5, 6, 14, 15, 16, 24, 25, 26, 27, 31, 32, 33, 34, 39, 40, 41, 47, 48, 55, 56, 57, 58, 59, 60, 64, 65, 66, 67, 68, 69, 70, 74, 75, 76, 77, 78, 79, 80, 84, 85, 86, 87, 92, 93, 94, 100, 101, 112, 113, 121, 122, 123, 131, 132, 133, 134, 135, 136, 137, 138, 143, 144, 145, 151, 152, 159, 160, 161, 162, 163, 164, 168, 169, 170, 171, 172, 173, 174, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 194, 195, 196, 202, 203, 210, 211, 226, 227, 240, 249, 250, 251, 252, 259, 260, 261 }

2.1.6 Sympy

A grade: { }

B grade: { 1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 28, 35, 36, 37, 38, 42, 43, 44, 45, 49, 50, 51, 52, 53, 61, 62, 71, 72, 88, 89, 90, 91, 95, 96, 97, 98, 102, 103, 104, 105, 106 }

C grade: { }

F grade: { 5, 6, 14, 15, 16, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 39, 40, 41, 46, 47, 48, 54, 55, 56, 57, 58, 59, 60, 63, 64, 65, 66, 67, 68, 69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 92, 93, 94, 99, 100, 101, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263 }

2.1.7 Giac

A grade: { 3, 12, 13, 42, 50, 110, 120, 146, 154, 224, 225, 231, 237, 238, 239, 245, 253, 254, 262, 263 }

B grade: { 2, 4, 7, 8, 9, 17, 18, 19, 22, 23, 28, 29, 30, 35, 49, 88, 111, 114, 115, 116, 124, 125, 126, 130, 139, 153, 190, 232, 233 }

C grade: { }

F grade: { 1, 5, 6, 10, 11, 14, 15, 16, 20, 21, 24, 25, 26, 27, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 112, 113, 117, 118, 119, 121, 122, 123, 127, 128, 129, 131, 132, 133, 134, 135, 136, 137, 138, 140, 141, 142, 143, 144, 145, 147, 148, 149, 150, 151, 152, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 226, 227, 228, 229, 230, 234, 235, 236, 240, 241, 242, 243, 244, 246, 247, 248, 249, 250, 251, 252, 255, 256, 257, 258, 259, 260, 261 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	212	232	261	7284	1380	1057	1187	0
normalized size	1	1.09	1.23	34.36	6.51	4.99	5.6	0.
time (sec)	N/A	0.345	0.22	0.221	1.819	1.358	9.871	0.

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	180	200	217	4593	906	774	870	555
normalized size	1	1.11	1.21	25.52	5.03	4.3	4.83	3.08
time (sec)	N/A	0.294	0.157	0.202	3.181	1.208	6.821	14.087

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	294	181	2407	487	486	505	296
normalized size	1	2.1	1.29	17.19	3.48	3.47	3.61	2.11
time (sec)	N/A	0.344	0.238	0.177	1.316	1.112	4.384	2.544

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	70	940	194	278	257	315
normalized size	1	1.	0.86	11.6	2.4	3.43	3.17	3.89
time (sec)	N/A	0.057	0.034	0.164	1.456	1.051	2.395	1.411

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	213	164	1044	325	0	0	0
normalized size	1	1.6	1.23	7.85	2.44	0.	0.	0.
time (sec)	N/A	0.353	0.114	0.191	1.58	0.	0.	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	221	175	1025	0	0	0	0
normalized size	1	1.56	1.23	7.22	0.	0.	0.	0.
time (sec)	N/A	0.384	0.157	0.097	0.	0.	0.	0.

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	191	208	394	770	366	382	286
normalized size	1	2.25	2.45	4.64	9.06	4.31	4.49	3.36
time (sec)	N/A	0.281	0.163	0.055	1.38	1.082	6.21	1.351

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	225	187	804	1260	747	629	544
normalized size	1	1.3	1.08	4.65	7.28	4.32	3.64	3.14
time (sec)	N/A	0.342	0.398	0.052	2.004	1.052	11.307	1.393

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	269	257	210	1226	1871	1230	928	905
normalized size	1	0.96	0.78	4.56	6.96	4.57	3.45	3.36
time (sec)	N/A	0.39	0.459	0.051	1.804	1.084	18.991	1.408

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	423	330	429	9298	2415	1509	1761	0
normalized size	1	0.78	1.01	21.98	5.71	3.57	4.16	0.
time (sec)	N/A	0.655	0.351	0.242	1.804	1.769	14.504	0.

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	337	296	362	6116	1620	1102	1292	0
normalized size	1	0.88	1.07	18.15	4.81	3.27	3.83	0.
time (sec)	N/A	0.508	0.25	0.191	1.454	1.396	9.675	0.

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	239	200	216	3439	906	774	870	441
normalized size	1	0.84	0.9	14.39	3.79	3.24	3.64	1.85
time (sec)	N/A	0.341	0.183	0.173	1.53	1.547	6.603	14.494

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	97	1522	378	467	503	240
normalized size	1	1.	0.82	12.9	3.2	3.96	4.26	2.03
time (sec)	N/A	0.067	0.04	0.155	1.381	1.355	3.701	2.04

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	276	354	252	2538	699	0	0	0
normalized size	1	1.28	0.91	9.2	2.53	0.	0.	0.
time (sec)	N/A	0.49	0.183	0.176	1.614	0.	0.	0.

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	247	313	221	1465	1339	0	0	0
normalized size	1	1.27	0.89	5.93	5.42	0.	0.	0.
time (sec)	N/A	0.518	0.232	0.161	1.761	0.	0.	0.

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	230	338	244	1495	0	0	0	0
normalized size	1	1.47	1.06	6.5	0.	0.	0.	0.
time (sec)	N/A	0.589	0.333	0.07	0.	0.	0.	0.

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	287	315	406	2045	544	610	463
normalized size	1	3.22	3.54	4.56	22.98	6.11	6.85	5.2
time (sec)	N/A	0.49	0.318	0.055	1.589	0.781	26.545	1.311

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	325	454	828	2994	1046	928	783
normalized size	1	1.8	2.51	4.57	16.54	5.78	5.13	4.33
time (sec)	N/A	0.571	0.387	0.05	1.788	0.813	48.275	1.715

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	359	344	1262	4089	1661	1300	1211
normalized size	1	1.28	1.22	4.49	14.55	5.91	4.63	4.31
time (sec)	N/A	0.678	0.888	0.054	2.692	0.797	88.471	1.419

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	457	416	586	11172	3560	1894	2188	0
normalized size	1	0.91	1.28	24.45	7.79	4.14	4.79	0.
time (sec)	N/A	0.945	0.591	0.222	1.522	1.794	20.544	0.

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	371	330	429	7597	2415	1509	1761	0
normalized size	1	0.89	1.16	20.48	6.51	4.07	4.75	0.
time (sec)	N/A	0.675	0.321	0.211	1.492	1.503	13.935	0.

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	271	232	261	4481	1380	1057	1187	690
normalized size	1	0.86	0.96	16.54	5.09	3.9	4.38	2.55
time (sec)	N/A	0.341	0.193	0.191	1.362	1.211	9.486	21.153

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	120	2172	593	664	719	606
normalized size	1	1.	0.81	14.58	3.98	4.46	4.83	4.07
time (sec)	N/A	0.081	0.059	0.171	1.183	0.839	5.284	1.499

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	356	436	352	4594	1148	0	0	0
normalized size	1	1.22	0.99	12.9	3.22	0.	0.	0.
time (sec)	N/A	0.602	0.266	0.192	1.583	0.	0.	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	373	521	374	3141	2026	0	0	0
normalized size	1	1.4	1.	8.42	5.43	0.	0.	0.
time (sec)	N/A	0.696	0.407	0.179	1.702	0.	0.	0.

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	345	442	314	1855	3108	0	0	0
normalized size	1	1.28	0.91	5.38	9.01	0.	0.	0.
time (sec)	N/A	0.718	0.44	0.164	1.887	0.	0.	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	310	424	308	1929	0	0	0	0
normalized size	1	1.37	0.99	6.22	0.	0.	0.	0.
time (sec)	N/A	0.782	0.497	0.067	0.	0.	0.	0.

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	373	427	406	4194	710	864	776
normalized size	1	4.19	4.8	4.56	47.12	7.98	9.71	8.72
time (sec)	N/A	0.722	0.495	0.052	1.997	0.542	157.452	1.328

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	B	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	409	608	828	5694	1337	0	1183
normalized size	1	2.26	3.36	4.57	31.46	7.39	0.	6.54
time (sec)	N/A	0.865	0.621	0.049	2.51	0.526	0.	1.375

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	445	642	1262	7457	2057	0	1678
normalized size	1	1.58	2.28	4.49	26.54	7.32	0.	5.97
time (sec)	N/A	0.976	1.092	0.053	3.326	0.595	0.	1.415

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	252	408	354	4297	1067	0	0	0
normalized size	1	1.62	1.4	17.05	4.23	0.	0.	0.
time (sec)	N/A	0.626	0.285	0.187	1.543	0.	0.	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	198	329	254	2309	644	0	0	0
normalized size	1	1.66	1.28	11.66	3.25	0.	0.	0.
time (sec)	N/A	0.487	0.171	0.189	1.453	0.	0.	0.

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	125	213	162	895	298	0	0	0
normalized size	1	1.7	1.3	7.16	2.38	0.	0.	0.
time (sec)	N/A	0.355	0.107	0.158	1.494	0.	0.	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	122	95	411	0	0	0	0
normalized size	1	1.61	1.25	5.41	0.	0.	0.	0.
time (sec)	N/A	0.215	0.032	0.056	0.	0.	0.	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	304	207	201	232	126	170	142
normalized size	1	6.91	4.7	4.57	5.27	2.86	3.86	3.23
time (sec)	N/A	0.584	0.114	0.052	1.172	0.494	1.532	1.386

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	437	292	605	572	329	386	0
normalized size	1	2.53	1.69	3.5	3.31	1.9	2.23	0.
time (sec)	N/A	0.703	0.299	0.056	1.302	0.509	3.055	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	255	535	418	1040	1195	732	889	0
normalized size	1	2.1	1.64	4.08	4.69	2.87	3.49	0.
time (sec)	N/A	0.877	0.378	0.055	1.539	0.489	7.534	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	373	620	492	1474	1983	1285	1392	0
normalized size	1	1.66	1.32	3.95	5.32	3.45	3.73	0.
time (sec)	N/A	1.078	0.725	0.053	1.972	0.559	22.179	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	341	519	359	2973	1810	0	0	0
normalized size	1	1.52	1.05	8.72	5.31	0.	0.	0.
time (sec)	N/A	0.727	0.427	0.174	1.594	0.	0.	0.

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	260	336	239	1382	1196	0	0	0
normalized size	1	1.29	0.92	5.32	4.6	0.	0.	0.
time (sec)	N/A	0.532	0.245	0.171	1.53	0.	0.	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	160	222	175	978	0	0	0	0
normalized size	1	1.39	1.09	6.11	0.	0.	0.	0.
time (sec)	N/A	0.403	0.163	0.061	0.	0.	0.	0.

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	101	104	515	181	177	231	116
normalized size	1	1.03	1.06	5.26	1.85	1.81	2.36	1.18
time (sec)	N/A	0.073	0.048	0.05	1.229	0.478	1.69	1.38

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	432	292	759	568	328	386	0
normalized size	1	2.77	1.87	4.87	3.64	2.1	2.47	0.
time (sec)	N/A	0.714	0.289	0.053	1.285	0.511	3.119	0.

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	261	462	324	1187	1160	686	828	0
normalized size	1	1.77	1.24	4.55	4.44	2.63	3.17	0.
time (sec)	N/A	0.868	0.452	0.053	1.426	0.515	7.054	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	364	630	453	1635	2323	1368	1562	0
normalized size	1	1.73	1.24	4.49	6.38	3.76	4.29	0.
time (sec)	N/A	1.117	0.791	0.056	1.852	0.568	29.671	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	457	705	520	2068	3456	2101	0	0
normalized size	1	1.54	1.14	4.53	7.56	4.6	0.	0.
time (sec)	N/A	1.363	1.423	0.055	2.428	0.612	0.	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	442	317	1815	2750	0	0	0
normalized size	1	1.22	0.88	5.03	7.62	0.	0.	0.
time (sec)	N/A	0.734	0.467	0.157	1.816	0.	0.	0.

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	251	340	245	1569	0	0	0	0
normalized size	1	1.35	0.98	6.25	0.	0.	0.	0.
time (sec)	N/A	0.607	0.33	0.056	0.	0.	0.	0.

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	191	207	1049	765	366	382	258
normalized size	1	2.25	2.44	12.34	9.	4.31	4.49	3.04
time (sec)	N/A	0.292	0.152	0.05	1.252	0.476	6.03	1.382

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	111	746	344	455	422	282
normalized size	1	1.	0.77	5.18	2.39	3.16	2.93	1.96
time (sec)	N/A	0.099	0.117	0.052	1.198	0.486	2.99	1.318

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	535	418	1287	1195	730	889	0
normalized size	1	2.2	1.72	5.3	4.92	3.	3.66	0.
time (sec)	N/A	0.898	0.467	0.054	1.423	0.534	8.049	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	631	452	1729	2323	1368	1562	0
normalized size	1	1.73	1.24	4.74	6.36	3.75	4.28	0.
time (sec)	N/A	1.111	0.788	0.053	1.904	0.567	33.036	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	463	673	533	2182	3213	2037	2106	0
normalized size	1	1.45	1.15	4.71	6.94	4.4	4.55	0.
time (sec)	N/A	1.406	1.274	0.058	2.095	0.604	65.196	0.

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	563	825	637	2616	5152	3140	0	0
normalized size	1	1.47	1.13	4.65	9.15	5.58	0.	0.
time (sec)	N/A	1.695	1.994	0.054	3.542	0.662	0.	0.

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	539	622	905	0	4301	0	0	0
normalized size	1	1.15	1.68	0.	7.98	0.	0.	0.
time (sec)	N/A	1.78	0.76	2.674	1.925	0.	0.	0.

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	450	537	680	0	3028	0	0	0
normalized size	1	1.19	1.51	0.	6.73	0.	0.	0.
time (sec)	N/A	1.49	0.547	2.228	1.832	0.	0.	0.

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	343	1214	869	0	1690	0	0	0
normalized size	1	3.54	2.53	0.	4.93	0.	0.	0.
time (sec)	N/A	2.817	0.7	2.007	1.696	0.	0.	0.

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	283	205	0	855	0	0	0
normalized size	1	1.39	1.01	0.	4.21	0.	0.	0.
time (sec)	N/A	0.433	0.208	1.796	1.642	0.	0.	0.

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	286	644	987	0	0	0	0	0
normalized size	1	2.25	3.45	0.	0.	0.	0.	0.
time (sec)	N/A	2.939	1.312	2.77	0.	0.	0.	0.

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	241	705	1407	0	0	0	0	0
normalized size	1	2.93	5.84	0.	0.	0.	0.	0.
time (sec)	N/A	3.028	2.464	3.008	0.	0.	0.	0.

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	639	765	865	2682	602	712	0
normalized size	1	4.53	5.43	6.13	19.02	4.27	5.05	0.
time (sec)	N/A	1.94	0.93	0.053	1.76	0.526	13.816	0.

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	287	741	1035	1765	4431	1249	1386	0
normalized size	1	2.58	3.61	6.15	15.44	4.35	4.83	0.
time (sec)	N/A	2.291	1.1	0.055	2.519	0.56	27.988	0.

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	445	826	1340	2689	6491	2048	0	0
normalized size	1	1.86	3.01	6.04	14.59	4.6	0.	0.
time (sec)	N/A	2.611	1.713	0.053	3.393	0.582	0.	0.

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	711	790	1559	0	6990	0	0	0
normalized size	1	1.11	2.19	0.	9.83	0.	0.	0.
time (sec)	N/A	3.006	1.348	3.027	2.138	0.	0.	0.

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	761	666	1194	0	4936	0	0	0
normalized size	1	0.88	1.57	0.	6.49	0.	0.	0.
time (sec)	N/A	2.396	0.914	2.686	1.975	0.	0.	0.

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	589	570	677	0	3050	0	0	0
normalized size	1	0.97	1.15	0.	5.18	0.	0.	0.
time (sec)	N/A	1.587	0.569	2.291	1.801	0.	0.	0.

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	334	420	287	0	1623	0	0	0
normalized size	1	1.26	0.86	0.	4.86	0.	0.	0.
time (sec)	N/A	0.532	0.216	2.044	1.816	0.	0.	0.

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	535	1676	1987	0	0	0	0	0
normalized size	1	3.13	3.71	0.	0.	0.	0.	0.
time (sec)	N/A	5.123	3.444	3.013	0.	0.	0.	0.

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	442	1219	2652	0	0	0	0	0
normalized size	1	2.76	6.	0.	0.	0.	0.	0.
time (sec)	N/A	3.887	8.364	3.704	0.	0.	0.	0.

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	387	932	3965	0	0	0	0	0
normalized size	1	2.41	10.25	0.	0.	0.	0.	0.
time (sec)	N/A	4.061	7.522	3.265	0.	0.	0.	0.

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	827	1355	890	7468	892	1178	0
normalized size	1	5.63	9.22	6.05	50.8	6.07	8.01	0.
time (sec)	N/A	3.132	2.21	0.055	3.366	0.563	69.11	0.

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	299	920	1788	1814	10842	1733	2054	0
normalized size	1	3.08	5.98	6.07	36.26	5.8	6.87	0.
time (sec)	N/A	3.691	3.109	0.053	4.875	0.59	133.626	0.

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	463	1009	2220	2761	14688	2804	0	0
normalized size	1	2.18	4.79	5.96	31.72	6.06	0.	0.
time (sec)	N/A	4.219	4.234	0.056	7.229	0.632	0.	0.

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1089	896	2330	0	9343	0	0	0
normalized size	1	0.82	2.14	0.	8.58	0.	0.	0.
time (sec)	N/A	4.27	3.14	2.264	2.374	0.	0.	0.

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	908	825	1555	0	7015	0	0	0
normalized size	1	0.91	1.71	0.	7.73	0.	0.	0.
time (sec)	N/A	3.022	1.345	2.914	2.122	0.	0.	0.

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	730	655	901	0	4344	0	0	0
normalized size	1	0.9	1.23	0.	5.95	0.	0.	0.
time (sec)	N/A	1.781	0.706	2.556	2.009	0.	0.	0.

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	420	503	389	0	2415	0	0	0
normalized size	1	1.2	0.93	0.	5.75	0.	0.	0.
time (sec)	N/A	0.617	0.304	2.146	1.871	0.	0.	0.

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	712	1868	3984	0	0	0	0	0
normalized size	1	2.62	5.6	0.	0.	0.	0.	0.
time (sec)	N/A	5.687	3.922	3.243	0.	0.	0.	0.

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	692	1751	5108	0	0	0	0	0
normalized size	1	2.53	7.38	0.	0.	0.	0.	0.
time (sec)	N/A	4.816	17.151	3.813	0.	0.	0.	0.

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	604	1412	6284	0	0	0	0	0
normalized size	1	2.34	10.4	0.	0.	0.	0.	0.
time (sec)	N/A	4.926	14.995	3.958	0.	0.	0.	0.

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	970	2470	890	15779	1127	0	0
normalized size	1	6.6	16.8	6.05	107.34	7.67	0.	0.
time (sec)	N/A	4.541	1.545	0.053	6.385	0.584	0.	0.

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	299	1061	2289	1814	21283	2209	0	0
normalized size	1	3.55	7.66	6.07	71.18	7.39	0.	0.
time (sec)	N/A	5.195	4.47	0.055	9.616	0.624	0.	0.

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	F(-1)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	463	1152	2583	2762	0	3443	0	0
normalized size	1	2.49	5.58	5.97	0.	7.44	0.	0.
time (sec)	N/A	6.077	5.932	0.053	0.	0.704	0.	0.

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	718	1828	4802	0	0	0	0	0
normalized size	1	2.55	6.69	0.	0.	0.	0.	0.
time (sec)	N/A	5.616	1.854	2.514	0.	0.	0.	0.

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	536	1666	1514	0	0	0	0	0
normalized size	1	3.11	2.82	0.	0.	0.	0.	0.
time (sec)	N/A	4.825	1.671	2.291	0.	0.	0.	0.

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	283	1072	646	0	0	0	0	0
normalized size	1	3.79	2.28	0.	0.	0.	0.	0.
time (sec)	N/A	4.132	0.75	2.141	0.	0.	0.	0.

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	721	251	888	0	0	0	0
normalized size	1	5.68	1.98	6.99	0.	0.	0.	0.
time (sec)	N/A	3.268	0.252	0.069	0.	0.	0.	0.

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	1163	79	312	536	184	206	211
normalized size	1	26.43	1.8	7.09	12.18	4.18	4.68	4.8
time (sec)	N/A	5.531	0.365	0.054	1.32	0.495	2.246	1.791

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	1684	186	1201	1361	512	541	0
normalized size	1	9.2	1.02	6.56	7.44	2.8	2.96	0.
time (sec)	N/A	6.331	0.663	0.054	1.533	0.522	4.551	0.

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	343	1899	318	2144	2855	1130	1488	0
normalized size	1	5.54	0.93	6.25	8.32	3.29	4.34	0.
time (sec)	N/A	7.366	1.133	0.059	2.12	0.528	12.327	0.

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	507	2044	442	3093	4636	1991	2388	0
normalized size	1	4.03	0.87	6.1	9.14	3.93	4.71	0.
time (sec)	N/A	8.431	1.465	0.059	2.78	0.602	50.194	0.

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	722	2224	5193	0	0	0	0	0
normalized size	1	3.08	7.19	0.	0.	0.	0.	0.
time (sec)	N/A	6.15	7.401	2.414	0.	0.	0.	0.

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	469	1681	1969	0	0	0	0	0
normalized size	1	3.58	4.2	0.	0.	0.	0.	0.
time (sec)	N/A	5.093	4.674	2.125	0.	0.	0.	0.

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	261	1060	1107	0	0	0	0	0
normalized size	1	4.06	4.24	0.	0.	0.	0.	0.
time (sec)	N/A	4.242	1.906	1.969	0.	0.	0.	0.

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	472	315	1236	562	319	432	0
normalized size	1	3.11	2.07	8.13	3.7	2.1	2.84	0.
time (sec)	N/A	0.782	0.437	0.052	1.339	0.513	3.859	0.

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	1687	187	1633	1355	510	539	0
normalized size	1	7.88	0.87	7.63	6.33	2.38	2.52	0.
time (sec)	N/A	6.471	0.709	0.059	1.572	0.521	4.926	0.

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	1521	307	2572	2693	1062	1404	0
normalized size	1	4.17	0.84	7.05	7.38	2.91	3.85	0.
time (sec)	N/A	7.176	1.042	0.053	1.921	0.559	11.071	0.

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	523	2071	466	3538	5652	2061	2683	0
normalized size	1	3.96	0.89	6.76	10.81	3.94	5.13	0.
time (sec)	N/A	8.459	1.447	0.061	3.155	0.591	65.538	0.

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	682	2222	613	4487	8316	3193	0	0
normalized size	1	3.26	0.9	6.58	12.19	4.68	0.	0.
time (sec)	N/A	9.479	2.106	0.065	4.429	0.694	0.	0.

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	635	1890	6052	0	0	0	0	0
normalized size	1	2.98	9.53	0.	0.	0.	0.	0.
time (sec)	N/A	6.241	7.815	2.443	0.	0.	0.	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	410	1328	2950	0	0	0	0	0
normalized size	1	3.24	7.2	0.	0.	0.	0.	0.
time (sec)	N/A	5.266	5.61	2.149	0.	0.	0.	0.

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	634	767	2449	2654	602	712	0
normalized size	1	4.5	5.44	17.37	18.82	4.27	5.05	0.
time (sec)	N/A	1.961	0.898	0.059	1.998	0.495	14.233	0.

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	296	577	444	1917	1145	767	892	0
normalized size	1	1.95	1.5	6.48	3.87	2.59	3.01	0.
time (sec)	N/A	0.914	0.449	0.055	1.555	0.517	6.614	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	375	1899	290	2842	2857	1129	1488	0
normalized size	1	5.06	0.77	7.58	7.62	3.01	3.97	0.
time (sec)	N/A	7.365	1.084	0.056	2.148	0.556	12.901	0.

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	525	2071	453	3802	5654	2061	2683	0
normalized size	1	3.94	0.86	7.24	10.77	3.93	5.11	0.
time (sec)	N/A	8.417	1.507	0.06	3.269	0.562	72.365	0.

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	B	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	685	1921	611	4782	7537	3056	3720	0
normalized size	1	2.8	0.89	6.98	11.	4.46	5.43	0.
time (sec)	N/A	9.579	1.961	0.058	3.482	0.699	142.653	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	851	2454	793	5731	12531	4744	0	0
normalized size	1	2.88	0.93	6.73	14.73	5.57	0.	0.
time (sec)	N/A	10.921	2.816	0.059	7.145	0.805	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	223	243	269	0	1509	1501	0	0
normalized size	1	1.09	1.21	0.	6.77	6.73	0.	0.
time (sec)	N/A	0.386	0.251	0.531	1.405	0.848	0.	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	190	210	225	0	999	1107	0	0
normalized size	1	1.11	1.18	0.	5.26	5.83	0.	0.
time (sec)	N/A	0.316	0.168	0.528	1.371	0.659	0.	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	B	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	311	189	0	531	666	0	329
normalized size	1	2.09	1.27	0.	3.56	4.47	0.	2.21
time (sec)	N/A	0.37	0.268	0.35	1.685	0.59	0.	10.146

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	74	0	211	360	0	339
normalized size	1	1.	0.86	0.	2.45	4.19	0.	3.94
time (sec)	N/A	0.061	0.039	0.371	1.244	0.518	0.	1.477

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	223	172	0	373	0	0	0
normalized size	1	1.58	1.22	0.	2.65	0.	0.	0.
time (sec)	N/A	0.345	0.123	0.619	2.891	0.	0.	0.

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	233	189	0	0	0	0	0
normalized size	1	1.55	1.26	0.	0.	0.	0.	0.
time (sec)	N/A	0.376	0.174	0.523	0.	0.	0.	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	201	216	0	786	510	0	320
normalized size	1	2.26	2.43	0.	8.83	5.73	0.	3.6
time (sec)	N/A	0.286	0.161	0.514	1.292	0.51	0.	1.238

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	236	196	0	1276	988	0	624
normalized size	1	1.3	1.08	0.	7.05	5.46	0.	3.45
time (sec)	N/A	0.341	0.461	0.531	1.499	0.56	0.	1.271

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	269	220	0	1887	1574	0	1025
normalized size	1	0.96	0.78	0.	6.72	5.6	0.	3.65
time (sec)	N/A	0.409	0.531	0.535	1.62	0.548	0.	1.391

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	442	345	441	0	2670	2202	0	0
normalized size	1	0.78	1.	0.	6.04	4.98	0.	0.
time (sec)	N/A	0.685	0.398	0.631	1.524	1.102	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	352	310	374	0	1804	1573	0	0
normalized size	1	0.88	1.06	0.	5.12	4.47	0.	0.
time (sec)	N/A	0.543	0.269	0.59	1.44	0.804	0.	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	250	210	224	0	999	1107	0	0
normalized size	1	0.84	0.9	0.	4.	4.43	0.	0.
time (sec)	N/A	0.355	0.199	0.507	1.34	0.653	0.	0.

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	101	0	417	622	0	277
normalized size	1	1.	0.81	0.	3.36	5.02	0.	2.23
time (sec)	N/A	0.074	0.047	0.457	1.321	0.562	0.	3.441

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	289	369	264	0	783	0	0	0
normalized size	1	1.28	0.91	0.	2.71	0.	0.	0.
time (sec)	N/A	0.489	0.186	0.686	3.199	0.	0.	0.

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	259	327	233	0	1607	0	0	0
normalized size	1	1.26	0.9	0.	6.2	0.	0.	0.
time (sec)	N/A	0.523	0.236	0.695	2.8	0.	0.	0.

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	242	354	258	0	0	0	0	0
normalized size	1	1.46	1.07	0.	0.	0.	0.	0.
time (sec)	N/A	0.56	0.355	0.671	0.	0.	0.	0.

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	93	301	329	0	2084	799	0	552
normalized size	1	3.24	3.54	0.	22.41	8.59	0.	5.94
time (sec)	N/A	0.516	0.338	0.673	1.61	0.514	0.	1.225

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	340	474	0	3033	1446	0	942
normalized size	1	1.8	2.51	0.	16.05	7.65	0.	4.98
time (sec)	N/A	0.6	0.433	0.688	1.955	0.558	0.	1.311

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	293	375	357	0	4128	2213	0	1443
normalized size	1	1.28	1.22	0.	14.09	7.55	0.	4.92
time (sec)	N/A	0.721	1.056	0.771	2.288	0.635	0.	1.34

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	477	435	631	0	3916	2716	0	0
normalized size	1	0.91	1.32	0.	8.21	5.69	0.	0.
time (sec)	N/A	0.992	0.588	0.678	1.602	1.83	0.	0.

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	387	345	441	0	2670	2202	0	0
normalized size	1	0.89	1.14	0.	6.9	5.69	0.	0.
time (sec)	N/A	0.7	0.345	0.688	1.534	1.154	0.	0.

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	283	243	269	0	1509	1501	0	0
normalized size	1	0.86	0.95	0.	5.33	5.3	0.	0.
time (sec)	N/A	0.382	0.215	0.536	1.501	0.796	0.	0.

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	124	0	647	883	0	680
normalized size	1	1.	0.79	0.	4.15	5.66	0.	4.36
time (sec)	N/A	0.086	0.073	0.498	1.408	0.635	0.	1.365

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	373	455	368	0	1262	0	0	0
normalized size	1	1.22	0.99	0.	3.38	0.	0.	0.
time (sec)	N/A	0.6	0.273	0.678	2.645	0.	0.	0.

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	390	543	394	0	2410	0	0	0
normalized size	1	1.39	1.01	0.	6.18	0.	0.	0.
time (sec)	N/A	0.691	0.419	0.699	2.765	0.	0.	0.

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	461	331	0	3707	0	0	0
normalized size	1	1.28	0.92	0.	10.27	0.	0.	0.
time (sec)	N/A	0.709	0.456	0.688	3.029	0.	0.	0.

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	326	444	326	0	0	0	0	0
normalized size	1	1.36	1.	0.	0.	0.	0.	0.
time (sec)	N/A	0.794	0.51	0.688	0.	0.	0.	0.

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	269	426	370	0	1354	0	0	0
normalized size	1	1.58	1.38	0.	5.03	0.	0.	0.
time (sec)	N/A	0.646	0.278	0.685	2.762	0.	0.	0.

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	343	266	0	846	0	0	0
normalized size	1	1.63	1.26	0.	4.01	0.	0.	0.
time (sec)	N/A	0.488	0.175	0.695	2.669	0.	0.	0.

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	223	170	0	413	0	0	0
normalized size	1	1.66	1.27	0.	3.08	0.	0.	0.
time (sec)	N/A	0.389	0.119	0.645	2.683	0.	0.	0.

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	128	101	0	0	0	0	0
normalized size	1	1.6	1.26	0.	0.	0.	0.	0.
time (sec)	N/A	0.202	0.032	0.611	0.	0.	0.	0.

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	316	219	0	236	169	0	143
normalized size	1	6.32	4.38	0.	4.72	3.38	0.	2.86
time (sec)	N/A	0.557	0.104	0.758	1.164	0.513	0.	1.31

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	181	455	304	0	576	446	0	0
normalized size	1	2.51	1.68	0.	3.18	2.46	0.	0.
time (sec)	N/A	0.689	0.284	0.75	1.323	0.504	0.	0.

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	266	557	434	0	1199	1023	0	0
normalized size	1	2.09	1.63	0.	4.51	3.85	0.	0.
time (sec)	N/A	0.834	0.381	0.764	1.429	0.557	0.	0.

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	389	646	518	0	1987	1809	0	0
normalized size	1	1.66	1.33	0.	5.11	4.65	0.	0.
time (sec)	N/A	1.077	0.754	0.773	1.793	0.599	0.	0.

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	359	541	375	0	2554	0	0	0
normalized size	1	1.51	1.04	0.	7.11	0.	0.	0.
time (sec)	N/A	0.727	0.44	0.66	2.632	0.	0.	0.

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	275	351	252	0	1719	0	0	0
normalized size	1	1.28	0.92	0.	6.25	0.	0.	0.
time (sec)	N/A	0.532	0.259	0.695	2.579	0.	0.	0.

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	234	183	0	0	0	0	0
normalized size	1	1.39	1.09	0.	0.	0.	0.	0.
time (sec)	N/A	0.387	0.179	0.514	0.	0.	0.	0.

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	107	114	0	184	221	0	134
normalized size	1	1.05	1.12	0.	1.8	2.17	0.	1.31
time (sec)	N/A	0.079	0.053	0.518	1.161	0.508	0.	1.797

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	166	450	304	0	572	444	0	0
normalized size	1	2.71	1.83	0.	3.45	2.67	0.	0.
time (sec)	N/A	0.679	0.314	0.762	1.297	0.529	0.	0.

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	273	482	342	0	1164	932	0	0
normalized size	1	1.77	1.25	0.	4.26	3.41	0.	0.
time (sec)	N/A	0.83	0.477	0.746	1.384	0.552	0.	0.

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	380	656	478	0	2327	1956	0	0
normalized size	1	1.73	1.26	0.	6.12	5.15	0.	0.
time (sec)	N/A	1.087	0.844	0.746	1.753	0.589	0.	0.

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	477	735	549	0	3460	3012	0	0
normalized size	1	1.54	1.15	0.	7.25	6.31	0.	0.
time (sec)	N/A	1.357	1.551	0.769	2.239	0.681	0.	0.

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	382	461	334	0	3907	0	0	0
normalized size	1	1.21	0.87	0.	10.23	0.	0.	0.
time (sec)	N/A	0.745	0.485	0.605	3.135	0.	0.	0.

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	356	259	0	0	0	0	0
normalized size	1	1.35	0.98	0.	0.	0.	0.	0.
time (sec)	N/A	0.597	0.355	0.68	0.	0.	0.	0.

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	201	215	0	780	509	0	298
normalized size	1	2.26	2.42	0.	8.76	5.72	0.	3.35
time (sec)	N/A	0.317	0.156	0.521	1.258	0.534	0.	1.252

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	115	0	350	562	0	309
normalized size	1	1.	0.76	0.	2.32	3.72	0.	2.05
time (sec)	N/A	0.104	0.133	0.538	1.205	0.525	0.	1.305

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	254	557	434	0	1199	1022	0	0
normalized size	1	2.19	1.71	0.	4.72	4.02	0.	0.
time (sec)	N/A	0.869	0.39	0.75	1.421	0.555	0.	0.

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	381	657	477	0	2327	1956	0	0
normalized size	1	1.72	1.25	0.	6.11	5.13	0.	0.
time (sec)	N/A	1.083	0.807	0.716	1.835	0.583	0.	0.

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	483	701	561	0	3217	2859	0	0
normalized size	1	1.45	1.16	0.	6.66	5.92	0.	0.
time (sec)	N/A	1.389	1.359	0.745	1.902	0.685	0.	0.

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	587	859	671	0	5156	4535	0	0
normalized size	1	1.46	1.14	0.	8.78	7.73	0.	0.
time (sec)	N/A	1.691	2.08	0.726	3.155	0.766	0.	0.

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	584	670	949	0	5081	0	0	0
normalized size	1	1.15	1.62	0.	8.7	0.	0.	0.
time (sec)	N/A	1.901	0.786	0.526	3.891	0.	0.	0.

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	487	578	716	0	3633	0	0	0
normalized size	1	1.19	1.47	0.	7.46	0.	0.	0.
time (sec)	N/A	1.586	0.576	0.517	3.546	0.	0.	0.

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	372	1323	937	0	2082	0	0	0
normalized size	1	3.56	2.52	0.	5.6	0.	0.	0.
time (sec)	N/A	2.878	0.726	0.335	3.624	0.	0.	0.

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	307	216	0	1114	0	0	0
normalized size	1	1.4	0.98	0.	5.06	0.	0.	0.
time (sec)	N/A	0.481	0.212	0.324	3.524	0.	0.	0.

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	306	692	742	0	0	0	0	0
normalized size	1	2.26	2.42	0.	0.	0.	0.	0.
time (sec)	N/A	2.874	1.861	0.527	0.	0.	0.	0.

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	261	766	1556	0	0	0	0	0
normalized size	1	2.93	5.96	0.	0.	0.	0.	0.
time (sec)	N/A	2.945	3.552	0.554	0.	0.	0.	0.

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	691	801	0	2723	1214	0	0
normalized size	1	4.58	5.3	0.	18.03	8.04	0.	0.
time (sec)	N/A	2.055	0.928	0.527	1.754	0.533	0.	0.

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	307	800	1079	0	4471	2388	0	0
normalized size	1	2.61	3.51	0.	14.56	7.78	0.	0.
time (sec)	N/A	2.432	1.196	0.54	2.216	0.612	0.	0.

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	475	892	1392	0	6531	3800	0	0
normalized size	1	1.88	2.93	0.	13.75	8.	0.	0.
time (sec)	N/A	2.875	1.464	0.532	3.06	0.697	0.	0.

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	766	848	1634	0	8035	0	0	0
normalized size	1	1.11	2.13	0.	10.49	0.	0.	0.
time (sec)	N/A	3.348	1.443	0.734	4.164	0.	0.	0.

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	819	714	1254	0	5733	0	0	0
normalized size	1	0.87	1.53	0.	7.	0.	0.	0.
time (sec)	N/A	2.609	1.022	0.691	3.92	0.	0.	0.

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	635	614	713	0	3594	0	0	0
normalized size	1	0.97	1.12	0.	5.66	0.	0.	0.
time (sec)	N/A	1.657	0.629	0.48	3.889	0.	0.	0.

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	454	303	0	1989	0	0	0
normalized size	1	1.26	0.84	0.	5.51	0.	0.	0.
time (sec)	N/A	0.543	0.238	0.527	3.694	0.	0.	0.

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	572	1790	1654	0	0	0	0	0
normalized size	1	3.13	2.89	0.	0.	0.	0.	0.
time (sec)	N/A	5.081	3.008	0.687	0.	0.	0.	0.

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	472	1309	2834	0	0	0	0	0
normalized size	1	2.77	6.	0.	0.	0.	0.	0.
time (sec)	N/A	3.765	15.576	0.714	0.	0.	0.	0.

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	417	1003	4761	0	0	0	0	0
normalized size	1	2.41	11.42	0.	0.	0.	0.	0.
time (sec)	N/A	3.841	14.402	0.748	0.	0.	0.	0.

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	889	1415	0	7544	1890	0	0
normalized size	1	5.66	9.01	0.	48.05	12.04	0.	0.
time (sec)	N/A	3.17	2.402	0.778	3.151	0.6	0.	0.

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	319	989	1860	0	10917	3484	0	0
normalized size	1	3.1	5.83	0.	34.22	10.92	0.	0.
time (sec)	N/A	3.789	3.146	0.703	4.474	0.716	0.	0.

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	493	1085	2320	0	14764	5374	0	0
normalized size	1	2.2	4.71	0.	29.95	10.9	0.	0.
time (sec)	N/A	4.316	3.967	0.733	6.14	0.835	0.	0.

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1172	961	2448	0	10591	0	0	0
normalized size	1	0.82	2.09	0.	9.04	0.	0.	0.
time (sec)	N/A	4.479	3.82	0.726	4.435	0.	0.	0.

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	976	886	1627	0	8007	0	0	0
normalized size	1	0.91	1.67	0.	8.2	0.	0.	0.
time (sec)	N/A	3.198	1.42	0.702	4.07	0.	0.	0.

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	786	706	945	0	5027	0	0	0
normalized size	1	0.9	1.2	0.	6.4	0.	0.	0.
time (sec)	N/A	1.93	0.726	0.534	4.635	0.	0.	0.

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	454	544	409	0	2874	0	0	0
normalized size	1	1.2	0.9	0.	6.33	0.	0.	0.
time (sec)	N/A	0.664	0.321	0.51	3.788	0.	0.	0.

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	762	1995	2941	0	0	0	0	0
normalized size	1	2.62	3.86	0.	0.	0.	0.	0.
time (sec)	N/A	5.624	4.917	0.672	0.	0.	0.	0.

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	739	1875	4942	0	0	0	0	0
normalized size	1	2.54	6.69	0.	0.	0.	0.	0.
time (sec)	N/A	4.738	14.471	0.686	0.	0.	0.	0.

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	644	1512	6221	0	0	0	0	0
normalized size	1	2.35	9.66	0.	0.	0.	0.	0.
time (sec)	N/A	4.811	24.699	0.727	0.	0.	0.	0.

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	561	1170	8775	0	0	0	0	0
normalized size	1	2.09	15.64	0.	0.	0.	0.	0.
time (sec)	N/A	5.093	8.154	0.695	0.	0.	0.	0.

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	768	1952	3265	0	0	0	0	0
normalized size	1	2.54	4.25	0.	0.	0.	0.	0.
time (sec)	N/A	5.585	4.222	0.676	0.	0.	0.	0.

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	573	1780	1741	0	0	0	0	0
normalized size	1	3.11	3.04	0.	0.	0.	0.	0.
time (sec)	N/A	4.746	1.591	0.694	0.	0.	0.	0.

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	303	1156	802	0	0	0	0	0
normalized size	1	3.82	2.65	0.	0.	0.	0.	0.
time (sec)	N/A	4.032	0.668	0.52	0.	0.	0.	0.

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	782	306	0	0	0	0	0
normalized size	1	5.71	2.23	0.	0.	0.	0.	0.
time (sec)	N/A	3.172	0.279	0.519	0.	0.	0.	0.

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	1237	90	0	549	339	0	217
normalized size	1	24.74	1.8	0.	10.98	6.78	0.	4.34
time (sec)	N/A	5.322	0.38	0.755	1.307	0.483	0.	1.341

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	199	1800	793	0	1374	956	0	0
normalized size	1	9.05	3.98	0.	6.9	4.8	0.	0.
time (sec)	N/A	6.088	0.792	0.701	1.548	0.541	0.	0.

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	369	2025	975	0	2870	2229	0	0
normalized size	1	5.49	2.64	0.	7.78	6.04	0.	0.
time (sec)	N/A	7.197	1.425	0.701	1.964	0.58	0.	0.

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	543	2180	1295	0	4651	3987	0	0
normalized size	1	4.01	2.38	0.	8.57	7.34	0.	0.
time (sec)	N/A	8.354	1.898	0.71	2.827	0.694	0.	0.

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	770	2384	4312	0	0	0	0	0
normalized size	1	3.1	5.6	0.	0.	0.	0.	0.
time (sec)	N/A	6.015	8.932	0.715	0.	0.	0.	0.

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	500	1807	2196	0	0	0	0	0
normalized size	1	3.61	4.39	0.	0.	0.	0.	0.
time (sec)	N/A	4.981	6.123	0.698	0.	0.	0.	0.

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	282	1157	1261	0	0	0	0	0
normalized size	1	4.1	4.47	0.	0.	0.	0.	0.
time (sec)	N/A	4.172	2.248	0.551	0.	0.	0.	0.

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	514	331	0	578	555	0	0
normalized size	1	3.15	2.03	0.	3.55	3.4	0.	0.
time (sec)	N/A	0.756	0.467	0.532	1.302	0.529	0.	0.

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	231	1803	789	0	1369	954	0	0
normalized size	1	7.81	3.42	0.	5.93	4.13	0.	0.
time (sec)	N/A	6.112	0.95	0.689	1.525	0.517	0.	0.

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	392	1621	870	0	2708	2006	0	0
normalized size	1	4.14	2.22	0.	6.91	5.12	0.	0.
time (sec)	N/A	6.812	1.423	0.696	1.831	0.586	0.	0.

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	560	2207	1340	0	5667	4177	0	0
normalized size	1	3.94	2.39	0.	10.12	7.46	0.	0.
time (sec)	N/A	8.15	2.034	0.74	2.964	0.717	0.	0.

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	729	2368	1695	0	8331	6518	0	0
normalized size	1	3.25	2.33	0.	11.43	8.94	0.	0.
time (sec)	N/A	9.291	3.07	0.7	4.056	0.83	0.	0.

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	676	2026	5730	0	0	0	0	0
normalized size	1	3.	8.48	0.	0.	0.	0.	0.
time (sec)	N/A	6.201	9.92	0.723	0.	0.	0.	0.

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	441	1435	3172	0	0	0	0	0
normalized size	1	3.25	7.19	0.	0.	0.	0.	0.
time (sec)	N/A	5.123	8.08	0.71	0.	0.	0.	0.

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	686	803	0	2693	1214	0	0
normalized size	1	4.54	5.32	0.	17.83	8.04	0.	0.
time (sec)	N/A	1.996	0.95	0.527	1.757	0.57	0.	0.

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	317	626	464	0	1162	1354	0	0
normalized size	1	1.97	1.46	0.	3.67	4.27	0.	0.
time (sec)	N/A	0.879	0.455	0.512	1.392	0.573	0.	0.

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	402	2025	971	0	2870	2228	0	0
normalized size	1	5.04	2.42	0.	7.14	5.54	0.	0.
time (sec)	N/A	7.043	1.34	0.693	2.02	0.577	0.	0.

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	562	2207	1334	0	5669	4177	0	0
normalized size	1	3.93	2.37	0.	10.09	7.43	0.	0.
time (sec)	N/A	8.134	2.125	0.698	2.924	0.701	0.	0.

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	732	2041	1653	0	7552	6098	0	0
normalized size	1	2.79	2.26	0.	10.32	8.33	0.	0.
time (sec)	N/A	9.227	2.65	0.737	3.284	0.825	0.	0.

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	B	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	908	2610	2138	0	12546	9756	0	0
normalized size	1	2.87	2.35	0.	13.82	10.74	0.	0.
time (sec)	N/A	10.511	4.309	0.727	6.425	1.049	0.	0.

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	189	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.975	0.538	3.169	0.	0.	0.	0.

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	190	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.884	0.508	2.14	0.	0.	0.	0.

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	292	0	206	0	0	5800	0	0
normalized size	1	0.	0.71	0.	0.	19.86	0.	0.
time (sec)	N/A	1.977	7.58	5.497	0.	0.826	0.	0.

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	210	0	134	0	0	2201	0	0
normalized size	1	0.	0.64	0.	0.	10.48	0.	0.
time (sec)	N/A	1.215	2.072	4.484	0.	0.651	0.	0.

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	168	78	0	0	647	0	0
normalized size	1	1.31	0.61	0.	0.	5.05	0.	0.
time (sec)	N/A	0.616	0.522	4.637	0.	0.573	0.	0.

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	A	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	125	0	0	0	0	227	0	0
normalized size	1	0.	0.	0.	0.	1.82	0.	0.
time (sec)	N/A	0.737	0.232	2.954	0.	0.496	0.	0.

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	A	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	206	0	0	0	0	676	0	0
normalized size	1	0.	0.	0.	0.	3.28	0.	0.
time (sec)	N/A	0.826	0.257	26.166	0.	0.545	0.	0.

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	B	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	295	0	0	0	0	1791	0	0
normalized size	1	0.	0.	0.	0.	6.07	0.	0.
time (sec)	N/A	0.815	0.324	23.922	0.	0.582	0.	0.

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	309	0	206	0	0	5785	0	0
normalized size	1	0.	0.67	0.	0.	18.72	0.	0.
time (sec)	N/A	2.055	6.694	5.698	0.	0.822	0.	0.

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	223	0	134	0	0	2186	0	0
normalized size	1	0.	0.6	0.	0.	9.8	0.	0.
time (sec)	N/A	1.159	2.036	4.479	0.	0.646	0.	0.

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	170	78	0	0	632	0	0
normalized size	1	1.24	0.57	0.	0.	4.61	0.	0.
time (sec)	N/A	0.616	0.508	4.586	0.	0.539	0.	0.

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	A	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	128	0	0	0	0	216	0	0
normalized size	1	0.	0.	0.	0.	1.69	0.	0.
time (sec)	N/A	0.695	0.235	3.039	0.	0.528	0.	0.

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	A	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	214	0	0	0	0	649	0	0
normalized size	1	0.	0.	0.	0.	3.03	0.	0.
time (sec)	N/A	0.776	0.26	25.665	0.	0.539	0.	0.

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	B	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	306	0	0	0	0	1764	0	0
normalized size	1	0.	0.	0.	0.	5.76	0.	0.
time (sec)	N/A	0.757	0.324	25.781	0.	0.547	0.	0.

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	40	0	0	153	0	63
normalized size	1	1.	0.98	0.	0.	3.73	0.	1.54
time (sec)	N/A	0.108	0.026	0.861	0.	0.537	0.	1.278

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	40	0	0	153	0	63
normalized size	1	1.	0.98	0.	0.	3.73	0.	1.54
time (sec)	N/A	0.041	0.011	1.394	0.	0.499	0.	1.279

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F(-2)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	193	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.811	0.438	3.535	0.	0.	0.	0.

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F(-2)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	194	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.711	0.398	3.481	0.	0.	0.	0.

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	43	64288	1034	906	0	0
normalized size	1	1.	0.96	1428.62	22.98	20.13	0.	0.
time (sec)	N/A	0.118	0.02	18.661	1.442	0.523	0.	0.

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	43	11062	522	466	0	0
normalized size	1	1.	0.96	245.82	11.6	10.36	0.	0.
time (sec)	N/A	0.112	0.015	2.427	1.369	0.484	0.	0.

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	43	1152	204	192	0	0
normalized size	1	1.	0.96	25.6	4.53	4.27	0.	0.
time (sec)	N/A	0.082	0.012	0.615	1.269	0.471	0.	0.

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	39	368	66	105	0	51
normalized size	1	1.	0.95	8.98	1.61	2.56	0.	1.24
time (sec)	N/A	0.122	0.087	0.407	1.729	0.492	0.	1.282

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	43	43	41	366	109	185	0	128
normalized size	1	1.	0.95	8.51	2.53	4.3	0.	2.98
time (sec)	N/A	0.122	0.02	0.399	1.805	0.507	0.	1.295

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	43	366	297	520	0	406
normalized size	1	1.	0.96	8.13	6.6	11.56	0.	9.02
time (sec)	N/A	0.122	0.02	0.404	2.095	0.496	0.	1.239

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	47	0	0	204	0	0
normalized size	1	1.	0.96	0.	0.	4.16	0.	0.
time (sec)	N/A	0.149	0.028	2.183	0.	0.545	0.	0.

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	51	0	0	215	0	0
normalized size	1	1.	0.93	0.	0.	3.91	0.	0.
time (sec)	N/A	0.216	0.046	2.22	0.	0.511	0.	0.

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	52	52	50	0	0	209	0	0
normalized size	1	1.	0.96	0.	0.	4.02	0.	0.
time (sec)	N/A	0.106	0.012	2.884	0.	0.546	0.	0.

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	39	368	66	105	0	51
normalized size	1	1.	0.95	8.98	1.61	2.56	0.	1.24
time (sec)	N/A	0.123	0.051	0.069	1.506	0.509	0.	1.169

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	43	374	72	111	0	57
normalized size	1	1.	0.91	7.96	1.53	2.36	0.	1.21
time (sec)	N/A	0.166	0.123	0.426	1.739	0.513	0.	1.215

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	42	371	69	108	0	54
normalized size	1	1.	0.95	8.43	1.57	2.45	0.	1.23
time (sec)	N/A	0.078	0.054	0.418	1.787	0.488	0.	1.223

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	88	88	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.11	0.36	1.237	0.	0.	0.	0.

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	220	0	0
normalized size	1	1.	1.	0.	0.	2.93	0.	0.
time (sec)	N/A	0.075	0.027	0.809	0.	0.484	0.	0.

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	177	0	0
normalized size	1	1.	1.	0.	0.	2.36	0.	0.
time (sec)	N/A	0.073	0.024	0.643	0.	0.476	0.	0.

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	134	0	0
normalized size	1	1.	1.	0.	0.	1.79	0.	0.
time (sec)	N/A	0.05	0.02	0.457	0.	0.504	0.	0.

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	72	0	0	90	0	0
normalized size	1	1.	1.	0.	0.	1.25	0.	0.
time (sec)	N/A	0.032	0.071	0.457	0.	0.457	0.	0.

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	33	33	34	0	50	78	0	43
normalized size	1	1.	1.03	0.	1.52	2.36	0.	1.3
time (sec)	N/A	0.075	0.07	0.815	1.745	0.486	0.	1.179

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	71	71	71	0	0	93	0	0
normalized size	1	1.	1.	0.	0.	1.31	0.	0.
time (sec)	N/A	0.029	0.069	0.44	0.	0.488	0.	0.

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	136	0	0
normalized size	1	1.	1.	0.	0.	1.81	0.	0.
time (sec)	N/A	0.047	0.017	0.439	0.	0.512	0.	0.

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	180	0	0
normalized size	1	1.	1.	0.	0.	2.4	0.	0.
time (sec)	N/A	0.07	0.018	0.67	0.	0.521	0.	0.

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	361	1021	0	0	0	0	0	0
normalized size	1	2.83	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.926	4.202	5.059	0.	0.	0.	0.

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	282	656	0	0	0	0	0	0
normalized size	1	2.33	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.211	3.094	3.089	0.	0.	0.	0.

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	371	1415	0	0	0	0	0
normalized size	1	1.83	6.97	0.	0.	0.	0.	0.
time (sec)	N/A	0.762	1.046	3.411	0.	0.	0.	0.

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	163	304	1447	0	0	0	0
normalized size	1	1.33	2.47	11.76	0.	0.	0.	0.
time (sec)	N/A	0.365	0.292	0.73	0.	0.	0.	0.

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.427	0.161	7.096	0.	0.	0.	0.

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.48	0.332	9.293	0.	0.	0.	0.

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	33	33	298	42	482	68	0	0
normalized size	1	1.	9.03	1.27	14.61	2.06	0.	0.
time (sec)	N/A	0.095	0.173	0.065	1.276	0.461	0.	0.

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	320	45	464	78	0	0
normalized size	1	1.	11.85	1.67	17.19	2.89	0.	0.
time (sec)	N/A	0.066	0.241	0.065	1.412	0.476	0.	0.

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	320	45	454	78	0	0
normalized size	1	1.	11.85	1.67	16.81	2.89	0.	0.
time (sec)	N/A	0.118	0.179	0.063	1.314	0.497	0.	0.

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	320	45	463	78	0	0
normalized size	1	1.	11.85	1.67	17.15	2.89	0.	0.
time (sec)	N/A	0.117	0.162	0.059	1.169	0.503	0.	0.

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	282	656	0	0	0	0	0	0
normalized size	1	2.33	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.312	2.645	3.54	0.	0.	0.	0.

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	371	1415	0	0	0	0	0
normalized size	1	1.83	6.97	0.	0.	0.	0.	0.
time (sec)	N/A	0.819	0.835	4.911	0.	0.	0.	0.

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	163	303	1447	0	0	0	0
normalized size	1	1.33	2.46	11.76	0.	0.	0.	0.
time (sec)	N/A	0.394	0.258	0.711	0.	0.	0.	0.

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	82	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.431	0.133	12.227	0.	0.	0.	0.

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	82	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.46	0.268	4.622	0.	0.	0.	0.

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [89] had the largest ratio of [0.7381]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	10	4	1.09	38	0.105
2	A	10	4	1.11	38	0.105
3	B	13	6	2.1	36	0.167
4	A	4	3	1.	28	0.107
5	A	14	11	1.6	38	0.29
6	A	15	11	1.56	38	0.29
7	B	10	4	2.25	38	0.105
8	A	10	4	1.3	38	0.105
9	A	10	4	0.96	38	0.105
10	A	14	4	0.78	40	0.1
11	A	14	4	0.88	40	0.1
12	A	10	4	0.84	38	0.105
13	A	4	3	1.	30	0.1

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
14	A	19	13	1.28	40	0.325
15	A	18	13	1.27	40	0.325
16	A	19	11	1.47	40	0.275
17	B	14	4	3.22	40	0.1
18	A	14	4	1.8	40	0.1
19	A	14	4	1.28	40	0.1
20	A	18	4	0.91	40	0.1
21	A	14	4	0.89	40	0.1
22	A	10	4	0.86	38	0.105
23	A	4	3	1.	30	0.1
24	A	23	13	1.22	40	0.325
25	A	22	14	1.4	40	0.35
26	A	22	13	1.28	40	0.325
27	A	23	11	1.37	40	0.275
28	B	18	4	4.19	40	0.1
29	B	18	4	2.26	40	0.1
30	A	18	4	1.58	40	0.1
31	A	23	13	1.62	40	0.325
32	A	19	13	1.66	40	0.325
33	A	14	11	1.7	38	0.29
34	A	10	8	1.61	30	0.267
35	C	20	9	6.91	40	0.225
36	C	24	11	2.53	40	0.275
37	C	28	11	2.1	40	0.275
38	C	32	11	1.66	40	0.275
39	A	22	14	1.52	40	0.35
40	A	18	13	1.29	40	0.325
41	A	15	11	1.39	38	0.29
42	A	4	3	1.03	30	0.1
43	C	24	11	2.77	40	0.275
44	C	28	11	1.77	40	0.275
45	C	32	11	1.73	40	0.275
46	C	36	11	1.54	40	0.275
47	A	22	13	1.22	40	0.325
48	A	19	11	1.35	40	0.275
49	B	10	4	2.25	38	0.105
50	A	4	3	1.	30	0.1
51	C	28	11	2.2	40	0.275
52	C	32	11	1.73	40	0.275
53	C	36	11	1.45	40	0.275
54	C	40	11	1.47	40	0.275
55	A	54	13	1.15	40	0.325
56	A	46	13	1.19	40	0.325
57	B	78	14	3.54	38	0.368

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
58	A	16	12	1.39	30	0.4
59	B	39	19	2.25	40	0.475
60	B	43	20	2.93	40	0.5
61	C	58	11	4.53	40	0.275
62	C	66	11	2.58	40	0.275
63	C	74	11	1.86	40	0.275
64	A	86	13	1.11	42	0.31
65	A	74	13	0.88	42	0.31
66	A	46	13	0.97	40	0.325
67	A	20	13	1.26	32	0.406
68	B	86	27	3.13	42	0.643
69	B	65	21	2.76	42	0.5
70	B	73	20	2.41	42	0.476
71	C	92	11	5.63	42	0.262
72	C	104	11	3.08	42	0.262
73	C	116	11	2.18	42	0.262
74	A	122	13	0.82	42	0.31
75	A	86	13	0.91	42	0.31
76	A	54	13	0.9	40	0.325
77	A	24	13	1.2	32	0.406
78	B	106	28	2.62	42	0.667
79	B	90	23	2.53	42	0.548
80	B	95	21	2.34	42	0.5
81	C	130	11	6.6	42	0.262
82	C	146	11	3.55	42	0.262
83	C	162	11	2.49	42	0.262
84	B	106	28	2.55	42	0.667
85	B	86	27	3.11	42	0.643
86	B	68	24	3.79	40	0.6
87	B	46	23	5.68	32	0.719
88	C	61	29	26.43	42	0.69
89	C	87	31	9.2	42	0.738
90	C	117	31	5.54	42	0.738
91	C	151	31	4.03	42	0.738
92	B	119	28	3.08	42	0.667
93	B	94	26	3.58	42	0.619
94	B	72	25	4.06	40	0.625
95	C	26	11	3.11	32	0.344
96	C	87	31	7.88	42	0.738
97	C	113	31	4.17	42	0.738
98	C	143	31	3.96	42	0.738
99	C	177	31	3.26	42	0.738
100	B	124	26	2.98	42	0.619
101	B	102	25	3.24	42	0.595

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
102	C	58	11	4.5	40	0.275
103	C	30	11	1.95	32	0.344
104	C	117	31	5.06	42	0.738
105	C	143	31	3.94	42	0.738
106	C	173	31	2.8	42	0.738
107	C	207	31	2.88	42	0.738
108	A	10	4	1.09	41	0.098
109	A	10	4	1.11	41	0.098
110	B	13	6	2.09	39	0.154
111	A	4	3	1.	31	0.097
112	A	13	10	1.58	41	0.244
113	A	14	11	1.55	41	0.268
114	B	10	4	2.26	41	0.098
115	A	10	4	1.3	41	0.098
116	A	10	4	0.96	41	0.098
117	A	14	4	0.78	43	0.093
118	A	14	4	0.88	43	0.093
119	A	10	4	0.84	41	0.098
120	A	4	3	1.	33	0.091
121	A	18	13	1.28	43	0.302
122	A	17	13	1.26	43	0.302
123	A	18	11	1.46	43	0.256
124	B	14	4	3.24	43	0.093
125	A	14	4	1.8	43	0.093
126	A	14	4	1.28	43	0.093
127	A	18	4	0.91	43	0.093
128	A	14	4	0.89	43	0.093
129	A	10	4	0.86	41	0.098
130	A	4	3	1.	33	0.091
131	A	22	13	1.22	43	0.302
132	A	21	14	1.39	43	0.326
133	A	21	13	1.28	43	0.302
134	A	22	11	1.36	43	0.256
135	A	22	13	1.58	43	0.302
136	A	18	13	1.63	43	0.302
137	A	13	10	1.66	41	0.244
138	A	9	8	1.6	33	0.242
139	C	18	8	6.32	43	0.186
140	C	22	11	2.51	43	0.256
141	C	26	11	2.09	43	0.256
142	C	30	11	1.66	43	0.256
143	A	21	14	1.51	43	0.326
144	A	17	13	1.28	43	0.302
145	A	14	11	1.39	41	0.268

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
146	A	4	3	1.05	33	0.091
147	C	22	11	2.71	43	0.256
148	C	26	11	1.77	43	0.256
149	C	30	11	1.73	43	0.256
150	C	34	11	1.54	43	0.256
151	A	21	13	1.21	43	0.302
152	A	18	11	1.35	43	0.256
153	B	10	4	2.26	41	0.098
154	A	4	3	1.	33	0.091
155	C	26	11	2.19	43	0.256
156	C	30	11	1.72	43	0.256
157	C	34	11	1.45	43	0.256
158	C	38	11	1.46	43	0.256
159	A	52	13	1.15	43	0.302
160	A	44	13	1.19	43	0.302
161	B	72	14	3.56	41	0.342
162	A	15	12	1.4	33	0.364
163	B	36	19	2.26	43	0.442
164	B	40	20	2.93	43	0.465
165	C	54	11	4.58	43	0.256
166	C	62	11	2.61	43	0.256
167	C	70	11	1.88	43	0.256
168	A	83	13	1.11	45	0.289
169	A	71	13	0.87	45	0.289
170	A	44	13	0.97	43	0.302
171	A	19	13	1.26	35	0.371
172	B	82	27	3.13	45	0.6
173	B	60	21	2.77	45	0.467
174	B	68	20	2.41	45	0.444
175	C	86	11	5.66	45	0.244
176	C	98	11	3.1	45	0.244
177	C	110	11	2.2	45	0.244
178	A	118	13	0.82	45	0.289
179	A	83	13	0.91	45	0.289
180	A	52	13	0.9	43	0.302
181	A	23	13	1.2	35	0.371
182	B	101	28	2.62	45	0.622
183	B	83	23	2.54	45	0.511
184	B	88	21	2.35	45	0.467
185	B	100	20	2.09	45	0.444
186	B	101	28	2.54	45	0.622
187	B	82	27	3.11	45	0.6
188	B	65	24	3.82	43	0.558
189	B	45	23	5.71	35	0.657

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
190	C	59	29	24.74	45	0.644
191	C	83	31	9.05	45	0.689
192	C	111	31	5.49	45	0.689
193	C	143	31	4.01	45	0.689
194	B	112	28	3.1	45	0.622
195	B	89	26	3.61	45	0.578
196	B	69	25	4.1	43	0.581
197	C	24	11	3.15	35	0.314
198	C	83	31	7.81	45	0.689
199	C	107	31	4.14	45	0.689
200	C	135	31	3.94	45	0.689
201	C	167	31	3.25	45	0.689
202	B	117	26	3.	45	0.578
203	B	97	25	3.25	45	0.556
204	C	54	11	4.54	43	0.256
205	C	28	11	1.97	35	0.314
206	C	111	31	5.04	45	0.689
207	C	135	31	3.93	45	0.689
208	C	163	31	2.79	45	0.689
209	C	195	31	2.87	45	0.689
210	F	0	0	N/A	0	N/A
211	F	0	0	N/A	0	N/A
212	F	0	0	N/A	0	N/A
213	F	0	0	N/A	0	N/A
214	A	6	4	1.31	47	0.085
215	F	0	0	N/A	0	N/A
216	F	0	0	N/A	0	N/A
217	F	0	0	N/A	0	N/A
218	F	0	0	N/A	0	N/A
219	F	0	0	N/A	0	N/A
220	A	6	4	1.24	47	0.085
221	F	0	0	N/A	0	N/A
222	F	0	0	N/A	0	N/A
223	F	0	0	N/A	0	N/A
224	A	1	1	1.	35	0.029
225	A	1	1	1.	42	0.024
226	F	0	0	N/A	0	N/A
227	F	0	0	N/A	0	N/A
228	A	1	1	1.	40	0.025
229	A	1	1	1.	40	0.025
230	A	1	1	1.	38	0.026
231	A	1	1	1.	40	0.025
232	A	1	1	1.	40	0.025
233	A	1	1	1.	40	0.025

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
234	A	1	1	1.	40	0.025
235	A	1	1	1.	46	0.022
236	A	1	1	1.	50	0.02
237	A	1	1	1.	40	0.025
238	A	1	1	1.	46	0.022
239	A	1	1	1.	50	0.02
240	A	1	1	1.	40	0.025
241	A	1	1	1.	35	0.029
242	A	1	1	1.	35	0.029
243	A	1	1	1.	33	0.03
244	A	1	1	1.	28	0.036
245	A	1	1	1.	35	0.029
246	A	1	1	1.	28	0.036
247	A	1	1	1.	33	0.03
248	A	1	1	1.	35	0.029
249	B	20	9	2.83	43	0.209
250	B	15	9	2.33	43	0.209
251	A	11	8	1.83	43	0.186
252	A	8	6	1.33	41	0.146
253	A	0	0	0.	0	0.
254	A	0	0	0.	0	0.
255	A	2	2	1.	40	0.05
256	A	2	2	1.	38	0.053
257	A	3	3	1.	33	0.091
258	A	3	3	1.	38	0.079
259	B	17	11	2.33	51	0.216
260	A	13	10	1.83	51	0.196
261	A	10	8	1.33	49	0.163
262	A	0	0	0.	0	0.
263	A	0	0	0.	0	0.

Chapter 3

Listing of integrals

3.1 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx$

Optimal. Leaf size=212

$$\frac{g^3i(a+bx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A-B\right)}{20b^2}+\frac{g^3i(a+bx)^4(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b}+\frac{Bg^3i(a+bx)^2(bc-ad)^3}{40b^2d^2}$$

```
[Out] -(B*(b*c - a*d)^4*g^3*i*x)/(20*b*d^3) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^2)
/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*(a + b*x)^3)/(60*b^2*d) + (g^3*i*(a
+ b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b) + ((b*c - a*
d)*g^3*i*(a + b*x)^4*(A - B + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^2) + (
B*(b*c - a*d)^5*g^3*i*Log[c + d*x])/(20*b^2*d^4)
```

Rubi [A] time = 0.345444, antiderivative size = 232, normalized size of antiderivative = 1.09, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 43}

$$\frac{g^3i(a+bx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^2}+\frac{dg^3i(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b^2}+\frac{Bg^3i(a+bx)^2(bc-ad)^3}{40b^2d^2}+\frac{Bg^3i(bc}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^4*g^3*i*x)/(20*b*d^3) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^2)
/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*(a + b*x)^3)/(60*b^2*d) - (B*(b*c -
a*d)*g^3*i*(a + b*x)^4)/(20*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(4*b^2) + (d*g^3*i*(a + b*x)^5*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(5*b^2) + (B*(b*c - a*d)^5*g^3*i*Log[c + d*x])/(20*b
^2*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (c+dx)(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{(bc-ad)(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b}+\frac{d(ag+bgx)^4\left(A+\right.}{bg}\right.$$

$$=\frac{(bc-ad)\int(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b}+\frac{d\int(ag+bgx)^4\left(\right.}{}$$

$$=\frac{(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2}+\frac{dg^3(a+bx)^5\left(A+B\log\right.}{5b^2}$$

$$=\frac{(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2}+\frac{dg^3(a+bx)^5\left(A+B\log\right.}{5b^2}$$

$$=\frac{(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2}+\frac{dg^3(a+bx)^5\left(A+B\log\right.}{5b^2}$$

$$=-\frac{B(bc-ad)^4g^3x}{20bd^3}+\frac{B(bc-ad)^3g^3(a+bx)^2}{40b^2d^2}-\frac{B(bc-ad)^2g^3(a+bx)^3}{60b^2d}$$

Mathematica [A] time = 0.22024, size = 261, normalized size = 1.23

$$\frac{g^3i\left(24d(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+30(a+bx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{5B(bc-ad)^2\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2\right.}{d^4}\right.}{120b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]
),x]
```

```
[Out] (g^3*i*(30*(b*c - a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2
4*d*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (5*B*(b*c - a*d)^2*(
6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^
3 - 6*(b*c - a*d)^3*Log[c + d*x]))/d^4 + (2*B*(b*c - a*d)*(12*b*d*(b*c - a*
d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3 -
```

```
3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]))/d^4))/(120*b^2)
```

Maple [B] time = 0.221, size = 7284, normalized size = 34.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.81904, size = 1380, normalized size = 6.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="maxima")
```

```
[Out] 1/5*A*b^3*d*g^3*i*x^5 + 1/4*A*b^3*c*g^3*i*x^4 + 3/4*A*a*b^2*d*g^3*i*x^4 + A
*a*b^2*c*g^3*i*x^3 + A*a^2*b*d*g^3*i*x^3 + 3/2*A*a^2*b*c*g^3*i*x^2 + 1/2*A*
a^3*d*g^3*i*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/
b - c*log(d*x + c)/d)*B*a^3*c*g^3*i + 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d
*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d
))*B*a^2*b*c*g^3*i + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2*c*g^3*i + 1/24*(6*x^4*log(b*e*x/(
d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4
 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*
c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*c*g^3*i + 1/2*(x^2*log(b*e*x/(d*x + c) +
 a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)
*x/(b*d))*B*a^3*d*g^3*i + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^2*b*d*g^3*i + 1/8*(6*x^4*log(b*e
*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)
/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(
b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*b^2*d*g^3*i + 1/60*(12*x^5*log(b*e*x/(
d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d
^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6
*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^3*d
*g^3*i + A*a^3*c*g^3*i*x
```

Fricas [B] time = 1.35829, size = 1057, normalized size = 4.99

$$24\,Ab^5d^5g^3ix^5 + 6\left((5\,A - B)b^5cd^4 + (15\,A + B)ab^4d^5\right)g^3ix^4 - 2\left(Bb^5c^2d^3 - 10\,(6\,A - B)ab^4cd^4 - (60\,A + 11\,B)a^2b^3d^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="fricas")
```

```
[Out] 1/120*(24*A*b^5*d^5*g^3*i*x^5 + 6*((5*A - B)*b^5*c*d^4 + (15*A + B)*a*b^4*d
^5)*g^3*i*x^4 - 2*(B*b^5*c^2*d^3 - 10*(6*A - B)*a*b^4*c*d^4 - (60*A + 11*B)
*a^2*b^3*d^5)*g^3*i*x^3 + 3*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 5*(12*A -
B)*a^2*b^3*c*d^4 + (20*A + 9*B)*a^3*b^2*d^5)*g^3*i*x^2 - 6*(B*b^5*c^4*d - 5
*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^2*d^3 - 5*(4*A + B)*a^3*b^2*c*d^4 - B*a^4
*b*d^5)*g^3*i*x + 6*(5*B*a^4*b*c*d^4 - B*a^5*d^5)*g^3*i*log(b*x + a) + 6*(B
*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 - 10*B*a^3*b^2*c^2*d^3)*g
^3*i*log(d*x + c) + 6*(4*B*b^5*d^5*g^3*i*x^5 + 20*B*a^3*b^2*c*d^4*g^3*i*x +
 5*(B*b^5*c*d^4 + 3*B*a*b^4*d^5)*g^3*i*x^4 + 20*(B*a*b^4*c*d^4 + B*a^2*b^3*
d^5)*g^3*i*x^3 + 10*(3*B*a^2*b^3*c*d^4 + B*a^3*b^2*d^5)*g^3*i*x^2)*log((b*e
*x + a*e)/(d*x + c)))/(b^2*d^4)
```

Sympy [B] time = 9.87056, size = 1187, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**3*d*g**3*i*x**5/5 - B*a**4*g**3*i*(a*d - 5*b*c)*log(x + (B*a**5*c*d**4
*g**3*i + B*a**5*d**4*g**3*i*(a*d - 5*b*c)/b - 15*B*a**4*b*c**2*d**3*g**3*i
 - B*a**4*c*d**3*g**3*i*(a*d - 5*b*c) + 10*B*a**3*b**2*c**3*d**2*g**3*i - 5
*B*a**2*b**3*c**4*d*g**3*i + B*a*b**4*c**5*g**3*i)/(B*a**5*d**5*g**3*i - 5*
B*a**4*b*c*d**4*g**3*i - 10*B*a**3*b**2*c**2*d**3*g**3*i + 10*B*a**2*b**3*c
**3*d**2*g**3*i - 5*B*a*b**4*c**4*d*g**3*i + B*b**5*c**5*g**3*i))/(20*b**2)
 - B*c**2*g**3*i*(10*a**3*d**3 - 10*a**2*b*c*d**2 + 5*a*b**2*c**2*d - b**3*
c**3)*log(x + (B*a**5*c*d**4*g**3*i - 15*B*a**4*b*c**2*d**3*g**3*i + 10*B*a
**3*b**2*c**3*d**2*g**3*i - 5*B*a**2*b**3*c**4*d*g**3*i + B*a*b**4*c**5*g**
3*i + B*a*b*c**2*g**3*i*(10*a**3*d**3 - 10*a**2*b*c*d**2 + 5*a*b**2*c**2*d
- b**3*c**3) - B*b**2*c**3*g**3*i*(10*a**3*d**3 - 10*a**2*b*c*d**2 + 5*a*b*
*2*c**2*d - b**3*c**3)/d)/(B*a**5*d**5*g**3*i - 5*B*a**4*b*c*d**4*g**3*i -
10*B*a**3*b**2*c**2*d**3*g**3*i + 10*B*a**2*b**3*c**3*d**2*g**3*i - 5*B*a*b
**4*c**4*d*g**3*i + B*b**5*c**5*g**3*i))/(20*d**4) + x**4*(3*A*a*b**2*d*g**
3*i/4 + A*b**3*c*g**3*i/4 + B*a*b**2*d*g**3*i/20 - B*b**3*c*g**3*i/20) + (B
*a**3*c*g**3*i*x + B*a**3*d*g**3*i*x**2/2 + 3*B*a**2*b*c*g**3*i*x**2/2 + B*
a**2*b*d*g**3*i*x**3 + B*a*b**2*c*g**3*i*x**3 + 3*B*a*b**2*d*g**3*i*x**4/4
+ B*b**3*c*g**3*i*x**4/4 + B*b**3*d*g**3*i*x**5/5)*log(e*(a + b*x)/(c + d*x
)) + x**3*(60*A*a**2*b*d**2*g**3*i + 60*A*a*b**2*c*d*g**3*i + 11*B*a**2*b*d
**2*g**3*i - 10*B*a*b**2*c*d*g**3*i - B*b**3*c**2*g**3*i)/(60*d) + x**2*(20
*A*a**3*d**3*g**3*i + 60*A*a**2*b*c*d**2*g**3*i + 9*B*a**3*d**3*g**3*i - 5*
B*a**2*b*c*d**2*g**3*i - 5*B*a*b**2*c**2*d*g**3*i + B*b**3*c**3*g**3*i)/(40
*d**2) + x*(20*A*a**3*b*c*d**3*g**3*i + B*a**4*d**4*g**3*i + 5*B*a**3*b*c*d
**3*g**3*i - 10*B*a**2*b**2*c**2*d**2*g**3*i + 5*B*a*b**3*c**3*d*g**3*i - B
*b**4*c**4*g**3*i)/(20*b*d**3)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="giac")
```

```
[Out] Timed out
```

3.2 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=180

$$\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A-B\right)}{12b^2}+\frac{g^2i(a+bx)^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b}-\frac{Bg^2i(bc-ad)^4\log(c+dx)}{12b^2d^3}$$

```
[Out] (B*(b*c - a*d)^3*g^2*i*x)/(12*b*d^2) - (B*(b*c - a*d)^2*g^2*i*(a + b*x)^2)/
(24*b^2*d) + (g^2*i*(a + b*x)^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/(4*b) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A - B + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(12*b^2) - (B*(b*c - a*d)^4*g^2*i*Log[c + d*x])/(12*b^2*d^3)
```

Rubi [A] time = 0.293748, antiderivative size = 200, normalized size of antiderivative = 1.11, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 43}

$$\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^2}+\frac{dg^2i(a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^2}-\frac{Bg^2i(bc-ad)^4\log(c+dx)}{12b^2d^3}-\frac{Bg^2i(a+$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^3*g^2*i*x)/(12*b*d^2) - (B*(b*c - a*d)^2*g^2*i*(a + b*x)^2)/
(24*b^2*d) - (B*(b*c - a*d)*g^2*i*(a + b*x)^3)/(12*b^2) + ((b*c - a*d)*g^2*
i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2) + (d*g^2*i*(a +
 b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b^2) - (B*(b*c - a*d)^4*g^
2*i*Log[c + d*x])/(12*b^2*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (2c+2dx)(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{2(bc-ad)(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b}+\frac{2d(ag+bg$$

$$=\frac{(2(bc-ad))\int(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b}+\frac{(2d)\int(a$$

$$=\frac{2(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2}+\frac{dg^2(a+bx)^4\left(A\right.}{2}$$

$$=\frac{2(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2}+\frac{dg^2(a+bx)^4\left(A\right.}{2}$$

$$=\frac{2(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2}+\frac{dg^2(a+bx)^4\left(A\right.}{2}$$

$$=\frac{B(bc-ad)^3g^2x}{6bd^2}-\frac{B(bc-ad)^2g^2(a+bx)^2}{12b^2d}-\frac{B(bc-ad)g^2(a+b}{6b^2}$$

Mathematica [A] time = 0.157149, size = 217, normalized size = 1.21

$$\frac{g^2i\left(6d(a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+8(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{4B(bc-ad)^2\left(2bdx(bc-ad)-2(bc-ad)^2\log(c+dx\right.}{d^3}\right.}{24b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]
),x]
```

```
[Out] (g^2*i*(8*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*
d*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (4*B*(b*c - a*d)^2*(2*
b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]))/d^3 -
(B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 +
2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/d^3))/(24*b^2)
```

Maple [B] time = 0.202, size = 4593, normalized size = 25.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] -1/3*e/d^2*B*g^2*i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3*a+1/2*e^3/d*B*g^2*
i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c^2+5/4*e^2/d*B*g^2*i/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^2*a^2*b^2*c^2+1/4*e^4*d*B*g^2*i*b^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4+2/3*e^3*d*B*g^2*i*b*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+1/4*e^4/d^3*B*
g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*b^6*c
```

```
^4-8/3*e^3*B*g^2*i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^3*a^3*c-2*e^2*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^2*a^3*b*c-e^4*B*g^2*i*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c-1/3*e^3/d^2*B*g^2*i*b^4/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^3*c^3*a-5/6*e^2/d^2*B*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^2*b^3*c^3*a+3/2*e^4/d*A*g^2*i*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*c^2
+4*e^3/d*A*g^2*i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c^2+1/12/d^3*B*g^2
*i*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^4-1/3*B*g^2*i/b*ln(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3*c+5/24*e^2*d*B*g^2*i/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^2*a^4+1/2*e^2*d*A*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4+1/2/d
*B*g^2*i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c^2+1/12*d*B*g^2*i/b^2
*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^4-1/3*e*B*g^2*i/(d*e/(d*x+c)*a-e
/(d*x+c)*b*c)*a^3*c-1/4*e^4*d^5*B*g^2*i/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^8/(d*x+c)^4-1/4*e^4/d^3*B*g^2*i*b^6*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^8/(d*x+c)^4-1
/2*e^2*d^3*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^2*a^6/(d*x+c)^2-1/2*e^2/d^3*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^6/(d*x+c)^2-7*e^4*d^3*B*g^2*i*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^6/(d*x+c)^4*c
^2+14*e^3*d^2*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^3*a^5/(d*x+c)^3*c^2-8/3*e^3/d^2*B*g^2*i*b^4*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3*a+10*e^2*B*g^2*i*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c^3*b+14*
e^4*B*g^2*i*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^4*a^3/(d*x+c)^4*c^5-e^4/d^2*A*g^2*i*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*
c^3*a-8/3*e^3/d^2*A*g^2*i*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3*a+5/24*e^
2/d^3*B*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^4+1/4*e^4/d^3*A*g^2*i*b
^6/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^4+1/4*e^4*d*A*g^2*i*b^2/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)^4*a^4+1/12*e^3/d^3*B*g^2*i*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^3*c^4-1/3*e^3*B*g^2*i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*c-5/6*e^2*B
*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*b*c-1/3/d^2*B*g^2*i*b*ln(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^3*a+1/2*e^2*d*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4+1/12*e/d^3*B*g^2*i*b^3/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)*c^4+1/12*e*d*B*g^2*i/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)*a^4+1/12*e^3*d*B*g^2*i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+1/2*e^2/d^3
*A*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^4-8/3*e^3*A*g^2*i*b^2/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*c-e^4*A*g^2*i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^4*a^3*c-2*e^2*A*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*b*c+2/3*e^3*d*
A*g^2*i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+2/3*e^3/d^3*A*g^2*i*b^5/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4+3*e^2/d*A*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^2*a^2*b^2*c^2-2*e^2/d^2*A*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^3*c^3*a
+1/2*e/d*B*g^2*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c^2*b+1/2*e^2/d^3*B*g^2*
i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4+2
/3*e^3/d^3*B*g^2*i*b^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^3*c^4+14/3*e^3/d^2*B*g^2*i*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3*a+2*e^4*d^4*B*g^2*i/b*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^7/(d*x+c)^4*c-14/3
*e^3*d^3*B*g^2*i/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^3*a^6/(d*x+c)^3*c-35/2*e^4*d*B*g^2*i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4/(d*x+c)^4*c^4+3*e^2*d^2*B*g^2*i*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^5/(d*x+c)^
2*c-14*e^3/d*B*g^2*i*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)^3*c^5/(d*x+c)^3*a^2-15/2*e^2/d*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2*a^2+2*e^4/d^2*B*g
^2*i*b^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^
7/(d*x+c)^4*a+3*e^2/d^2*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*e/(d
*x+c)*a-e/(d*x+c)*b*c)^2*c^5/(d*x+c)^2*a-70/3*e^3*d*B*g^2*i*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4/(d*x+c)^3*c^3*b+14*e^4
*d^2*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^
```

```
4*a^5/(d*x+c)^4*c^3*b-7*e^4/d*B*g^2*i*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^6/(d*x+c)^4*a^2-15/2*e^2*d*B*g^2*i*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2*c^2-
2*e^2/d^2*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^2*c^3*a-e^4/d^2*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^4*b^5*c^3*a+3/2*e^4/d*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^4*c^2+4*e^3/d*B*g^2*i*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*b^3*c^2+2/3*e^3
*d^4*B*g^2*i/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)^3*a^7/(d*x+c)^3+3*e^2/d*B*g^2*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*
e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c^2-2/3*e^3/d^3*B*g^2*i*b^5*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^7/(d*x+c)^3+70/3*e^3*B*
g^2*i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c
^4/(d*x+c)^3*a^3
```

Maxima [B] time = 3.18149, size = 906, normalized size = 5.03

$$\frac{1}{4}Ab^2dg^2ix^4 + \frac{1}{3}Ab^2cg^2ix^3 + \frac{2}{3}Aabdg^2ix^3 + Aabcg^2ix^2 + \frac{1}{2}Aa^2dg^2ix^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="maxima")
```

```
[Out] 1/4*A*b^2*d*g^2*i*x^4 + 1/3*A*b^2*c*g^2*i*x^3 + 2/3*A*a*b*d*g^2*i*x^3 + A*a
*b*c*g^2*i*x^2 + 1/2*A*a^2*d*g^2*i*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^2*c*g^2*i + (x^2*log(b*e*x
/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 -
 (b*c - a*d)*x/(b*d))*B*a*b*c*g^2*i + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/
(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*c*g^2*i + 1/2*(x^2
*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x
+ c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^2*d*g^2*i + 1/3*(2*x^3*log(b*e*x/(d*x +
 c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b*d*g^2*i
+ 1/24*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4
 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d -
 a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^2*d*g^2*i + A*a^2
*c*g^2*i*x
```

Fricas [B] time = 1.20818, size = 774, normalized size = 4.3

$$\frac{6\,Ab^4d^4g^2ix^4 + 2\left((4\,A - B)b^4cd^3 + (8\,A + B)ab^3d^4\right)g^2ix^3 - \left(Bb^4c^2d^2 - 4\,(6\,A - B)ab^3cd^3 - (12\,A + 5\,B)a^2b^2d^4\right)g^2ix^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^2*i*x^4 + 2*((4*A - B)*b^4*c*d^3 + (8*A + B)*a*b^3*d^4)
*g^2*i*x^3 - (B*b^4*c^2*d^2 - 4*(6*A - B)*a*b^3*c*d^3 - (12*A + 5*B)*a^2*b^
2*d^4)*g^2*i*x^2 + 2*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 2*(6*A + B)*a^2*b^2
```

```
*c*d^3 + B*a^3*b*d^4)*g^2*i*x + 2*(4*B*a^3*b*c*d^3 - B*a^4*d^4)*g^2*i*log(b
*x + a) - 2*(B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2)*g^2*i*log(d
*x + c) + 2*(3*B*b^4*d^4*g^2*i*x^4 + 12*B*a^2*b^2*c*d^3*g^2*i*x + 4*(B*b^4*
c*d^3 + 2*B*a*b^3*d^4)*g^2*i*x^3 + 6*(2*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*g^2*
i*x^2)*log((b*e*x + a*e)/(d*x + c)))/(b^2*d^3)
```

Sympy [B] time = 6.82122, size = 870, normalized size = 4.83

$$\frac{Ab^2dg^2ix^4}{4} - \frac{Ba^3g^2i\,(ad-4bc)\log\left(x + \frac{Ba^4cd^3g^2i + \frac{Ba^4d^3g^2i(ad-4bc)}{b} - 10Ba^3bc^2d^2g^2i - Ba^3cd^2g^2i(ad-4bc) + 4Ba^2b^2c^3dg^2i - Bab^3c^4g^2i}{Ba^4d^4g^2i - 4Ba^3bcd^3g^2i - 6Ba^2b^2c^2d^2g^2i + 4Bab^3c^3dg^2i - Bb^4c^4g^2i}\right)}{12b^2} - \frac{Bc^2g^2i\,(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**2*d*g**2*i*x**4/4 - B*a**3*g**2*i*(a*d - 4*b*c)*log(x + (B*a**4*c*d**3
*g**2*i + B*a**4*d**3*g**2*i*(a*d - 4*b*c)/b - 10*B*a**3*b*c**2*d**2*g**2*i
 - B*a**3*c*d**2*g**2*i*(a*d - 4*b*c) + 4*B*a**2*b**2*c**3*d*g**2*i - B*a*b
**3*c**4*g**2*i)/(B*a**4*d**4*g**2*i - 4*B*a**3*b*c*d**3*g**2*i - 6*B*a**2*
b**2*c**2*d**2*g**2*i + 4*B*a*b**3*c**3*d*g**2*i - B*b**4*c**4*g**2*i))/(12
*b**2) - B*c**2*g**2*i*(6*a**2*d**2 - 4*a*b*c*d + b**2*c**2)*log(x + (B*a**
4*c*d**3*g**2*i - 10*B*a**3*b*c**2*d**2*g**2*i + 4*B*a**2*b**2*c**3*d*g**2*
i - B*a*b**3*c**4*g**2*i + B*a*b*c**2*g**2*i*(6*a**2*d**2 - 4*a*b*c*d + b**
2*c**2) - B*b**2*c**3*g**2*i*(6*a**2*d**2 - 4*a*b*c*d + b**2*c**2)/d)/(B*a*
*4*d**4*g**2*i - 4*B*a**3*b*c*d**3*g**2*i - 6*B*a**2*b**2*c**2*d**2*g**2*i
+ 4*B*a*b**3*c**3*d*g**2*i - B*b**4*c**4*g**2*i))/(12*d**3) + x**3*(2*A*a*b
*d*g**2*i/3 + A*b**2*c*g**2*i/3 + B*a*b*d*g**2*i/12 - B*b**2*c*g**2*i/12) +
 (B*a**2*c*g**2*i*x + B*a**2*d*g**2*i*x**2/2 + B*a*b*c*g**2*i*x**2 + 2*B*a*
b*d*g**2*i*x**3/3 + B*b**2*c*g**2*i*x**3/3 + B*b**2*d*g**2*i*x**4/4)*log(e*
(a + b*x)/(c + d*x)) + x**2*(12*A*a**2*d**2*g**2*i + 24*A*a*b*c*d*g**2*i +
5*B*a**2*d**2*g**2*i - 4*B*a*b*c*d*g**2*i - B*b**2*c**2*g**2*i)/(24*d) + x*
(12*A*a**2*b*c*d**2*g**2*i + B*a**3*d**3*g**2*i + 2*B*a**2*b*c*d**2*g**2*i
- 4*B*a*b**2*c**2*d*g**2*i + B*b**3*c**3*g**2*i)/(12*b*d**2)
```

Giac [B] time = 14.0868, size = 555, normalized size = 3.08

$$\frac{1}{4}\left(Ab^2dg^2i + Bb^2dg^2i\right)x^4 + \frac{1}{12}\left(4\,Ab^2cg^2i + 3\,Bb^2cg^2i + 8\,Aabdg^2i + 9\,Babdg^2i\right)x^3 - \frac{\left(Bb^2c^2g^2i - 24\,Aabcdg^2i - 20\,Babc\right.}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="giac")
```

```
[Out] 1/4*(A*b^2*d*g^2*i + B*b^2*d*g^2*i)*x^4 + 1/12*(4*A*b^2*c*g^2*i + 3*B*b^2*c
*g^2*i + 8*A*a*b*d*g^2*i + 9*B*a*b*d*g^2*i)*x^3 - 1/24*(B*b^2*c^2*g^2*i - 2
4*A*a*b*c*d*g^2*i - 20*B*a*b*c*d*g^2*i - 12*A*a^2*d^2*g^2*i - 17*B*a^2*d^2*
g^2*i)*x^2/d + 1/12*(3*B*b^2*d*g^2*i*x^4 + 12*B*a^2*c*g^2*i*x + 4*(B*b^2*c*
g^2*i + 2*B*a*b*d*g^2*i)*x^3 + 6*(2*B*a*b*c*g^2*i + B*a^2*d*g^2*i)*x^2)*log
((b*x + a)/(d*x + c)) + 1/12*(4*B*a^3*b*c*g^2*i - B*a^4*d*g^2*i)*log(b*x +
a)/b^2 + 1/12*(B*b^3*c^3*g^2*i - 4*B*a*b^2*c^2*d*g^2*i + 12*A*a^2*b*c*d^2*g
^2*i + 14*B*a^2*b*c*d^2*g^2*i + B*a^3*d^3*g^2*i)*x/(b*d^2) - 1/12*(B*b^2*c^
4*g^2*i - 4*B*a*b*c^3*d*g^2*i + 6*B*a^2*c^2*d^2*g^2*i)*log(-d*i*x - c*i)/d^
```

3

3.3 $\int (ag + bgx)(ci + dix)\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=140

$$\frac{gi(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A-B\right)}{6b^2}+\frac{gi(a+bx)^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b}+\frac{Bgi(bc-ad)^3\log(c+dx)}{6b^2d^2}-$$

```
[Out] -(B*(b*c - a*d)^2*g*i*x)/(6*b*d) + (g*i*(a + b*x)^2*(c + d*x)*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(3*b) + ((b*c - a*d)*g*i*(a + b*x)^2*(A - B + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(6*b^2) + (B*(b*c - a*d)^3*g*i*Log[c + d*x])/(
6*b^2*d^2)
```

Rubi [B] time = 0.344012, antiderivative size = 294, normalized size of antiderivative = 2.1, number of steps used = 13, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2528, 2486, 31, 2525, 12, 72}

$$-\frac{1}{3}bBdgix\left(\frac{a^2}{b^2}-\frac{c^2}{d^2}\right)-\frac{a^2Bgi(ad+bc)\log(a+bx)}{2b^2}+\frac{a^3Bdgi\log(a+bx)}{3b^2}+\frac{1}{3}bdgix^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{1}{2}gix^2(ad$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] a*A*c*g*i*x - (b*B*(a^2/b^2 - c^2/d^2)*d*g*i*x)/3 - (B*(b*c - a*d)*(b*c + a
*d)*g*i*x)/(2*b*d) - (B*(b*c - a*d)*g*i*x^2)/6 + (a^3*B*d*g*i*Log[a + b*x])
/(3*b^2) - (a^2*B*(b*c + a*d)*g*i*Log[a + b*x])/(2*b^2) + (a*B*c*g*i*(a + b
*x)*Log[(e*(a + b*x))/(c + d*x)])/b + ((b*c + a*d)*g*i*x^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/2 + (b*d*g*i*x^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/3 - (b*B*c^3*g*i*Log[c + d*x])/(3*d^2) - (a*B*c*(b*c - a*d)*g*i*Log[c + d
*x])/(b*d) + (B*c^2*(b*c + a*d)*g*i*Log[c + d*x])/(2*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (3c+3dx)(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int \left(3acg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)+3(bc+ad)gx\left(A+B\log\left(\right.\right.\right.$$

$$= (3acg)\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx + (3bdg)\int x^2\left(A+B\log\right.$$

$$= 3aAcgx + \frac{3}{2}(bc+ad)gx^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) + bdgx^3\left(A+\right.$$

$$= 3aAcgx + \frac{3aBcg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b} + \frac{3}{2}(bc+ad)gx^2\left(A+B\right.$$

$$= 3aAcgx + \frac{3aBcg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b} + \frac{3}{2}(bc+ad)gx^2\left(A+B\right.$$

$$= 3aAcgx - \frac{B(bc-ad)(bc+ad)gx}{2bd} - \frac{1}{2}B(bc-ad)gx^2 + \frac{a^3Bdg\log}{b}$$

Mathematica [A] time = 0.238177, size = 181, normalized size = 1.29

$$\frac{gi\left(b\left(dx\left(a^2Bd^2+abd(6Ac+3Adx+Bdx)+Ab^2dx(3c+2dx)+b^2(-B)c(c+dx)\right)+Bc\left(6a^2d^2-3abcd+b^2c^2\right)\log(c\right.\right.}{6b^2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),
x]
```

```
[Out] (g*i*(-(a^2*B*d^2*(3*b*c + a*d)*Log[a + b*x]) + b*(d*x*(a^2*B*d^2 - b^2*B*c
*(c + d*x) + A*b^2*d*x*(3*c + 2*d*x) + a*b*d*(6*A*c + 3*A*d*x + B*d*x)) + B
*d^2*(6*a^2*c + 3*a*b*x*(2*c + d*x) + b^2*x^2*(3*c + 2*d*x))*Log[(e*(a + b*
x))/(c + d*x)] + B*c*(b^2*c^2 - 3*a*b*c*d + 6*a^2*d^2)*Log[c + d*x])))/(6*b
^2*d^2)
```

Maple [B] time = 0.177, size = 2407, normalized size = 17.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] 1/3*e^3*d*B*g*i*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)^3*a^3-3/2*e^2*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)^2*a^2*b*c-e^3*B*g*i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d
*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c+1/2*e/d*B*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*
a*c^2*b+1/2*e^2/d*B*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^2*c^2*a+3/2*e^2/d
*A*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^2*c^2*a+1/2/d*B*g*i*ln(d*(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-b*e)*c^2*a-1/6/d^2*B*g*i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))-b*e)*c^3*b+1/2*e^2*d*A*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3+1/6*e^
2*d*B*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3-1/2*B*g*i/b*ln(d*(b*e/d+(a*d-
b*c)*e/d/(d*x+c))-b*e)*a^2*c+1/6*d*B*g*i/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-b*e)*a^3-1/2*e*B*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c+e^3/d*A*g*i*b
^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^2*a-1/2*e^2/d^2*B*g*i*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3-1/3*e^3/d^2*B*g*i*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3*b^4+1/3*
e^3*d*A*g*i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3-1/6*e/d^2*B*g*i*b^2/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)*c^3-1/2*e^2/d^2*A*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^2*b^3*c^3-1/3*e^3/d^2*A*g*i*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3-1/6*e
^2/d^2*B*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^3*c^3+1/2*e^2*d*B*g*i*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3+1/6*e*d*B*g*i
/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3-e^3*A*g*i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^3*a^2*c-1/2*e^2*B*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*b*c-3/2*e^2
*A*g*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*b*c-20/3*e^3*d*B*g*i*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3/(d*x+c)^3*a^3*b-2*
e^3/d*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3
*c^5/(d*x+c)^3*b^3*a+5/2*e^2*d^2*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2*c-2*e^3*d^3*B*g*i/b*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5/(d*x+c)^3*c-5/2*e^
2/d*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c
^4/(d*x+c)^2*a*b^2+5*e^3*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)^3*c^4/(d*x+c)^3*a^2*b^2+5*e^2*B*g*i*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*c^3*b+1/3*e^3/d^2*
B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^6/(
d*x+c)^3*b^4+1/2*e^2/d^2*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)^2*c^5/(d*x+c)^2*b^3+5*e^3*d^2*B*g*i*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^2/(d*x+c)^3*a^4-1/2*e^2*d^3*B*
g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^5
/(d*x+c)^2+1/3*e^3*d^4*B*g*i/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^3*a^6/(d*x+c)^3-5*e^2*d*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c^2+3/2*e^2/d*B*g*i*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2*a+e^3
/d*B*g*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^
2*b^3*a
```

Maxima [B] time = 1.31585, size = 487, normalized size = 3.48

$$\frac{1}{3}Abdgix^3 + \frac{1}{2}Abcgix^2 + \frac{1}{2}Aadgix^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Bacgi + \frac{1}{2}\left(x^2\log\left(\frac{b}{dx}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm
="maxima")
```

```
[Out] 1/3*A*b*d*g*i*x^3 + 1/2*A*b*c*g*i*x^2 + 1/2*A*a*d*g*i*x^2 + (x*log(b*e*x/(d
*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a*c*g*i +
 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2
*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*b*c*g*i + 1/2*(x^2*log(b*e*x/(d*
x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*
c - a*d)*x/(b*d))*B*a*d*g*i + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c
)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)
*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b*d*g*i + A*a*c*g*i*x
```

Fricas [A] time = 1.11211, size = 486, normalized size = 3.47

$$\frac{2\,Ab^3d^3gix^3 + \left((3\,A - B)b^3cd^2 + (3\,A + B)ab^2d^3\right)gix^2 - \left(Bb^3c^2d - 6\,Aab^2cd^2 - Ba^2bd^3\right)gix + \left(3\,Ba^2bcd^2 - Ba^3d^3\right)gi\,l}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm
="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g*i*x^3 + ((3*A - B)*b^3*c*d^2 + (3*A + B)*a*b^2*d^3)*g*i*
x^2 - (B*b^3*c^2*d - 6*A*a*b^2*c*d^2 - B*a^2*b*d^3)*g*i*x + (3*B*a^2*b*c*d^
2 - B*a^3*d^3)*g*i*log(b*x + a) + (B*b^3*c^3 - 3*B*a*b^2*c^2*d)*g*i*log(d*x
 + c) + (2*B*b^3*d^3*g*i*x^3 + 6*B*a*b^2*c*d^2*g*i*x + 3*(B*b^3*c*d^2 + B*a
*b^2*d^3)*g*i*x^2)*log((b*e*x + a*e)/(d*x + c)))/(b^2*d^2)
```

Sympy [B] time = 4.38369, size = 505, normalized size = 3.61

$$\frac{Abdgix^3}{3} - \frac{Ba^2gi\,(ad - 3bc)\log\left(x + \frac{Ba^3cd^2gi + \frac{Ba^3d^2gi(ad-3bc)}{b} - 6Ba^2bc^2dgi - Ba^2cdgi(ad-3bc) + Bab^2c^3gi}{Ba^3d^3gi - 3Ba^2bcd^2gi - 3Bab^2c^2dgi + Bb^3c^3gi}\right)}{6b^2} - \frac{Bc^2gi\,(3ad - bc)\log\left(x + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b*d*g*i*x**3/3 - B*a**2*g*i*(a*d - 3*b*c)*log(x + (B*a**3*c*d**2*g*i + B*
a**3*d**2*g*i*(a*d - 3*b*c)/b - 6*B*a**2*b*c**2*d*g*i - B*a**2*c*d*g*i*(a*d
 - 3*b*c) + B*a*b**2*c**3*g*i)/(B*a**3*d**3*g*i - 3*B*a**2*b*c*d**2*g*i - 3
*B*a*b**2*c**2*d*g*i + B*b**3*c**3*g*i))/(6*b**2) - B*c**2*g*i*(3*a*d - b*c
)*log(x + (B*a**3*c*d**2*g*i - 6*B*a**2*b*c**2*d*g*i + B*a*b**2*c**3*g*i +
B*a*b*c**2*g*i*(3*a*d - b*c) - B*b**2*c**3*g*i*(3*a*d - b*c)/d)/(B*a**3*d**
3*g*i - 3*B*a**2*b*c*d**2*g*i - 3*B*a*b**2*c**2*d*g*i + B*b**3*c**3*g*i))/(
6*d**2) + x**2*(A*a*d*g*i/2 + A*b*c*g*i/2 + B*a*d*g*i/6 - B*b*c*g*i/6) + (B
*a*c*g*i*x + B*a*d*g*i*x**2/2 + B*b*c*g*i*x**2/2 + B*b*d*g*i*x**3/3)*log(e*
(a + b*x)/(c + d*x)) + x*(6*A*a*b*c*d*g*i + B*a**2*d**2*g*i - B*b**2*c**2*g
*i)/(6*b*d)
```

Giac [A] time = 2.54362, size = 296, normalized size = 2.11

$$\frac{1}{3}\left(Abdgi + Bbdgi\right)x^3 + \frac{1}{6}\left(3\,Abcgi + 2\,Bbcgi + 3\,Aadgi + 4\,Badgi\right)x^2 + \frac{1}{6}\left(2\,Bbdgix^3 + 6\,Bacgix + 3\left(Bbcgi + Badgi\right)x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm
="giac")
```

```
[Out] 1/3*(A*b*d*g*i + B*b*d*g*i)*x^3 + 1/6*(3*A*b*c*g*i + 2*B*b*c*g*i + 3*A*a*d*
g*i + 4*B*a*d*g*i)*x^2 + 1/6*(2*B*b*d*g*i*x^3 + 6*B*a*c*g*i*x + 3*(B*b*c*g*
i + B*a*d*g*i)*x^2)*log((b*x + a)/(d*x + c)) - 1/6*(B*b^2*c^2*g*i - 6*A*a*b
*c*d*g*i - 6*B*a*b*c*d*g*i - B*a^2*d^2*g*i)*x/(b*d) + 1/6*(B*b*c^3*g*i - 3*
B*a*c^2*d*g*i)*log(d*i*x + c*i)/d^2 + 1/6*(3*B*a^2*b*c*g*i - B*a^3*d*g*i)*l
og(b*x + a)/b^2
```

3.4 $\int (ci + dix)\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=81

$$\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d}-\frac{Bi(bc-ad)^2\log(a+bx)}{2b^2d}-\frac{Bix(bc-ad)}{2b}$$

```
[Out] -(B*(b*c - a*d)*i*x)/(2*b) - (B*(b*c - a*d)^2*i*Log[a + b*x])/(2*b^2*d) + (
i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d)
```

Rubi [A] time = 0.0567414, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {2525, 12, 43}

$$\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d}-\frac{Bi(bc-ad)^2\log(a+bx)}{2b^2d}-\frac{Bix(bc-ad)}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*i*x)/(2*b) - (B*(b*c - a*d)^2*i*Log[a + b*x])/(2*b^2*d) + (
i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (4c+4dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d} - \frac{B\int \frac{16(bc-ad)(c+dx)}{a+bx}dx}{8d}$$
$$= \frac{2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d} - \frac{(2B(bc-ad))\int \frac{c+dx}{a+bx}dx}{d}$$
$$= \frac{2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d} - \frac{(2B(bc-ad))\int \left(\frac{d}{b}+\frac{bc-ad}{b(a+bx)}\right)dx}{d}$$
$$= -\frac{2B(bc-ad)x}{b} - \frac{2B(bc-ad)^2\log(a+bx)}{b^2d} + \frac{2(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d}$$

Mathematica [A] time = 0.0344547, size = 70, normalized size = 0.86

$$\frac{i\left((c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B(bc-ad)((bc-ad)\log(a+bx)+bdx)}{b^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (i*(-((B*(b*c - a*d)*(b*d*x + (b*c - a*d)*Log[a + b*x]))/b^2) + (c + d*x)^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(2*d)
```

Maple [B] time = 0.164, size = 940, normalized size = 11.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] 1/2*e^2*d*A*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2-e^2*A*i/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^2*a*b*c+1/2*e^2/d*A*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^2*c^2+
1/2*e*d*B*i/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-e*B*i/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)*a*c+1/2*e/d*B*i/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*b+1/2*d*B*i/b^2*
ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-B*i/b*ln(d*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))-b*e)*a*c+1/2/d*B*i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2+1/
2*e^2*d*B*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2
*a^2-e^2*B*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^
2*a*b*c-1/2*e^2*d^3*B*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2+2*e^2*d^2*B*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c-3*e^2*d*B*i*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*c^2+2*e^
2*B*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a/(d*
x+c)^2*c^3*b+1/2*e^2/d*B*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)^2*c^2-1/2*e^2/d*B*i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2
```

Maxima [A] time = 1.45613, size = 194, normalized size = 2.4

$$\frac{1}{2}Adix^2 + \left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)Bci + \frac{1}{2}\left(x^2\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log(bx+a}{b^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/2*A*d*i*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b
- c*log(d*x + c)/d)*B*c*i + 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) -
 a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*d*i +
 A*c*i*x
```

Fricas [A] time = 1.05063, size = 278, normalized size = 3.43

$$\frac{Ab^2d^2ix^2 - Bb^2c^2i\log(dx+c) + \left((2A-B)b^2cd + Babd^2\right)ix + \left(2Babcd - Ba^2d^2\right)i\log(bx+a) + \left(Bb^2d^2ix^2 + 2Bb^2cdi \ldots\right.}{2b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*i*x^2 - B*b^2*c^2*i*log(d*x + c) + ((2*A - B)*b^2*c*d + B*a*
b*d^2)*i*x + (2*B*a*b*c*d - B*a^2*d^2)*i*log(b*x + a) + (B*b^2*d^2*i*x^2 +
2*B*b^2*c*d*i*x)*log((b*e*x + a*e)/(d*x + c)))/(b^2*d)
```

Sympy [B] time = 2.39451, size = 257, normalized size = 3.17

$$\frac{Adix^2}{2} - \frac{Bai(ad-2bc)\log\left(x + \frac{Ba^2cdi + \frac{Ba^2di(ad-2bc)}{b} - 3Babc^2i - Baci(ad-2bc)}{Ba^2d^2i - 2Babcdi - Bb^2c^2i}\right)}{2b^2} - \frac{Bc^2i\log\left(x + \frac{Ba^2cdi - 2Babc^2i - \frac{Bb^2c^3i}{d}}{Ba^2d^2i - 2Babcdi - Bb^2c^2i}\right)}{2d} + \left(Bcix + \ldots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*d*i*x**2/2 - B*a*i*(a*d - 2*b*c)*log(x + (B*a**2*c*d*i + B*a**2*d*i*(a*d
- 2*b*c)/b - 3*B*a*b*c**2*i - B*a*c*i*(a*d - 2*b*c))/(B*a**2*d**2*i - 2*B*a
*b*c*d*i - B*b**2*c**2*i))/(2*b**2) - B*c**2*i*log(x + (B*a**2*c*d*i - 2*B*
a*b*c**2*i - B*b**2*c**3*i/d)/(B*a**2*d**2*i - 2*B*a*b*c*d*i - B*b**2*c**2*
i))/(2*d) + (B*c*i*x + B*d*i*x**2/2)*log(e*(a + b*x)/(c + d*x)) + x*(2*A*b*
c*i + B*a*d*i - B*b*c*i)/(2*b)
```

Giac [B] time = 1.41107, size = 315, normalized size = 3.89

$$\frac{1}{2}(Adi + Bdi)x^2 + \frac{1}{2}\left(Bdix^2 + 2Bcix\right)\log\left(\frac{bx+a}{dx+c}\right) + \frac{(2Abci + Bbci + Badi)x}{2b} - \frac{\left(Bb^2c^2i - 2Babcdi + Ba^2d^2i\right)\log\left(|bc \ldots\right.}{4b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/2*(A*d*i + B*d*i)*x^2 + 1/2*(B*d*i*x^2 + 2*B*c*i*x)*log((b*x + a)/(d*x +
c)) + 1/2*(2*A*b*c*i + B*b*c*i + B*a*d*i)*x/b - 1/4*(B*b^2*c^2*i - 2*B*a*b*
```

```
c*d*i + B*a^2*d^2*i)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^2*d) + 1/4*
(B*b^3*c^3*i + B*a*b^2*c^2*d*i - 3*B*a^2*b*c*d^2*i + B*a^3*d^3*i)*log(abs((
2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*
d))))/(b^2*d*abs(-b*c + a*d))
```

3.5 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=133

$$\frac{Bi(bc-ad)\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b^2g}-\frac{i(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A-B\right)}{b^2g}+\frac{i(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.}{bg}$$

```
[Out] (i*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*g) - ((b*c - a*d)*i*L
og[-((b*c - a*d)/(d*(a + b*x)))]*(A - B + B*Log[(e*(a + b*x))/(c + d*x)]))/
(b^2*g) + (B*(b*c - a*d)*i*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*
g)
```

Rubi [A] time = 0.3527, antiderivative size = 213, normalized size of antiderivative = 1.6, number of steps used = 14, number of rules used = 11, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.29, Rules used = {2528, 2486, 31, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bi(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}+\frac{i(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g}+\frac{Bdi(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g}-\frac{Bi(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x),x]
```

```
[Out] (A*d*i*x)/(b*g) - (B*(b*c - a*d)*i*Log[a + b*x]^2)/(2*b^2*g) + (B*d*i*(a +
b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^2*g) + ((b*c - a*d)*i*Log[a + b*x]*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g) - (B*(b*c - a*d)*i*Log[c + d*x]
)/(b^2*g) + (B*(b*c - a*d)*i*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
b^2*g) + (B*(b*c - a*d)*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(5c+5dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}dx = \int \left(\frac{5d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg} + \frac{5(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg(a+bx)}\right)dx$$

$$= \frac{(5d)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{bg} + \frac{(5(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{bg}$$

$$= \frac{5Adx}{bg} + \frac{5(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g} + \frac{(5Bd)\int\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg}$$

$$= \frac{5Adx}{bg} + \frac{5Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{5(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^2g}$$

$$= \frac{5Adx}{bg} + \frac{5Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{5(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^2g}$$

$$= \frac{5Adx}{bg} + \frac{5Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{5(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^2g}$$

$$= \frac{5Adx}{bg} + \frac{5Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{5(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^2g}$$

$$= \frac{5Adx}{bg} - \frac{5B(bc-ad)\log^2(a+bx)}{2b^2g} + \frac{5Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{5(bc-ad)\,\mathrm{l}}{}$$

$$= \frac{5Adx}{bg} - \frac{5B(bc-ad)\log^2(a+bx)}{2b^2g} + \frac{5Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{5(bc-ad)\,\mathrm{l}}{}$$

Mathematica [A] time = 0.113839, size = 164, normalized size = 1.23

$$\frac{i\left(2B(bc-ad)\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)+2\left(Bd(a+bx)\log\right.\right.}{2b^2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x
),x]
```

```
[Out] (i*((-(b*B*c) + a*B*d)*Log[a + b*x]^2 + 2*(A*b*d*x + B*d*(a + b*x)*Log[(e*(
a + b*x))/(c + d*x)] + (-(b*B*c) + a*B*d)*Log[c + d*x]) + 2*(b*c - a*d)*Log
[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)] + B*Log[(b*(c + d*x))/(b*c -
a*d)]) + 2*B*(b*c - a*d)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/(2*b^2*
g)
```

Maple [B] time = 0.191, size = 1044, normalized size = 7.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] -d*i/g*A/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+i/g*A/b*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*c+e*d*i/g*A/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e*i/g*A/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)*c+d*i/g*A/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*
a-i/g*A/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-1/2*d*i/g*B/b^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/2*i/g*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*
c+d*i/g*B/b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a-i/g*B/b*d
ilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c+d*i/g*B/b^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a-i/g*B/
b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)
/b/e)*c-d*i/g*B/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+i/g*B/b*ln(d*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+e*d*i/g*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e*i/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c+e*d^2*i/g*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a^2-2*e*d*i/g*B/b*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*c+e*i/g*B*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2
```

Maxima [A] time = 1.5801, size = 325, normalized size = 2.44

$$Adi\left(\frac{x}{bg}-\frac{a\log\left(bx+a\right)}{b^2g}\right)+\frac{Aci\log\left(bgx+ag\right)}{bg}-\frac{Bci\log\left(dx+c\right)}{bg}+\frac{(bci-adi)\left(\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx\cdots}{bc-\cdots}\right.\right.}{b^2g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm
="maxima")
```

```
[Out] A*d*i*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + A*c*i*log(b*g*x + a*g)/(b*g) - B
*c*i*log(d*x + c)/(b*g) + (b*c*i - a*d*i)*(log(b*x + a)*log((b*d*x + a*d)/(
b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^2*g) + 1/2*(2*B*b
*d*i*x*log(e) + (b*c*i - a*d*i)*B*log(b*x + a)^2 + 2*(B*b*d*i*x + (b*c*i*lo
g(e) - (i*log(e) - i)*a*d)*B)*log(b*x + a) - 2*(B*b*d*i*x + (b*c*i - a*d*i)
*B*log(b*x + a))*log(d*x + c))/(b^2*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{Adix+Aci+(Bdix+Bci)\log\left(\frac{bex+ae}{dx+c}\right)}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm
="fricas")
```

```
[Out] integral((A*d*i*x + A*c*i + (B*d*i*x + B*c*i)*log((b*e*x + a*e)/(d*x + c)))
/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm
="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g), x
)
```

3.6 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=142

$$\frac{BdiPolyLog\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}-\frac{di\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2}-\frac{i(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg^2(a+bx)}-\frac{Bi(c+dx)}{bg^2(a+bx)}$$

```
[Out] -((B*i*(c + d*x))/(b*g^2*(a + b*x))) - (i*(c + d*x)*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (B*d*i*PolyLog[2, (b*(c
 + d*x))/(d*(a + b*x))])/(b^2*g^2)
```

Rubi [A] time = 0.383937, antiderivative size = 221, normalized size of antiderivative = 1.56, number of steps used = 15, number of rules used = 11, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.29, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{BdiPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2}+\frac{di\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2}-\frac{i(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2(a+bx)}-\frac{Bi(bc-ad)}{b^2g^2(a+bx)}+\frac{Bdi}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^2,x]
```

```
[Out] -((B*(b*c - a*d)*i)/(b^2*g^2*(a + b*x))) - (B*d*i*Log[a + b*x])/(b^2*g^2) -
 (B*d*i*Log[a + b*x]^2)/(2*b^2*g^2) - ((b*c - a*d)*i*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(b^2*g^2*(a + b*x)) + (d*i*Log[a + b*x]*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(b^2*g^2) + (B*d*i*Log[c + d*x])/(b^2*g^2) + (B*d*i*Log[
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) + (B*d*i*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))])/(b^2*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(6c+6dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx = \int \left(\frac{6(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)^2} + \frac{6d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)}\right) dx$$

$$= \frac{(6d)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{bg^2} + \frac{(6(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{bg^2}$$

$$= -\frac{6(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} + \frac{6d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2} - (6Ba$$

$$= -\frac{6(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} + \frac{6d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2} + (6B($$

$$= -\frac{6(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} + \frac{6d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2} + (6B($$

$$= -\frac{6B(bc-ad)}{b^2g^2(a+bx)} - \frac{6Bd\log(a+bx)}{b^2g^2} - \frac{6(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} + 6d\log(a$$

$$= -\frac{6B(bc-ad)}{b^2g^2(a+bx)} - \frac{6Bd\log(a+bx)}{b^2g^2} - \frac{6(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} + 6d\log(a$$

$$= -\frac{6B(bc-ad)}{b^2g^2(a+bx)} - \frac{6Bd\log(a+bx)}{b^2g^2} - \frac{3Bd\log^2(a+bx)}{b^2g^2} - \frac{6(bc-ad)\left(A+B\log\right(}{b^2g^2(a+bx)}$$

$$= -\frac{6B(bc-ad)}{b^2g^2(a+bx)} - \frac{6Bd\log(a+bx)}{b^2g^2} - \frac{3Bd\log^2(a+bx)}{b^2g^2} - \frac{6(bc-ad)\left(A+B\log\right(}{b^2g^2(a+bx)}$$

Mathematica [A] time = 0.157152, size = 175, normalized size = 1.23

$$\frac{i\left(2Bd(a+bx)\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2d(a+bx)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)+A-B\right)-2(A+B)(bc-a}{2b^2g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x
)^2,x]
```

```
[Out] (i*(-2*(A + B)*(b*c - a*d) - B*d*(a + b*x)*Log[a + b*x]^2 + 2*(-(b*B*c) + a
*B*d)*Log[(e*(a + b*x))/(c + d*x)] + 2*B*d*(a + b*x)*Log[c + d*x] + 2*d*(a
+ b*x)*Log[a + b*x]*(A - B + B*Log[(e*(a + b*x))/(c + d*x)] + B*Log[(b*(c +
 d*x))/(b*c - a*d)]) + 2*B*d*(a + b*x)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)]))/(2*b^2*g^2*(a + b*x))
```

Maple [B] time = 0.097, size = 1025, normalized size = 7.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x)
```

```
[Out] -e*d*i/(a*d-b*c)/g^2*A/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*i/(a*d-b*c
)/g^2*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+d^2*i/(a*d-b*c)/g^2*A/b^2*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-d*i/(a*d-b*c)/g^2*A/b*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*c-d^2*i/(a*d-b*c)/g^2*A/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*
e)*a+d*i/(a*d-b*c)/g^2*A/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+1/2*d^
2*i/(a*d-b*c)/g^2*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*d*i/(a*d-b*
c)/g^2*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^2*i/(a*d-b*c)/g^2*B/b^2*di
log(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+d*i/(a*d-b*c)/g^2*B/b*dil
og(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-d^2*i/(a*d-b*c)/g^2*B/b^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b
/e)*a+d*i/(a*d-b*c)/g^2*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(
a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-e*d*i/(a*d-b*c)/g^2*B/b/(b*e/d+e/(d*x+c)*
a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+e*i/(a*d-b*c)/g^2*B/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-e*d*i/(
a*d-b*c)/g^2*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*i/(a*d-b*c)/g^2*B/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-Bdi\left(\frac{((bx+a)\log(bx+a)+a)\log(dx+c)}{b^3g^2x+ab^2g^2} - \int \frac{b^2dx^2\log(e)+a^2d+\left(b^2c\log(e)+abd\right)x+\left(2\,b^2dx^2+a^2d+\left(b^2c+\right.\right.}{b^4dg^2x^3+a^2b^2cg^2+\left(b^4cg^2+2\,ab^3dg^2\right)x^2+\left(2\,ab^3cg^2+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorit
hm="maxima")
```

```
[Out] -B*d*i*(((b*x + a)*log(b*x + a) + a)*log(d*x + c)/(b^3*g^2*x + a*b^2*g^2) -
 integrate((b^2*d*x^2*log(e) + a^2*d + (b^2*c*log(e) + a*b*d)*x + (2*b^2*d*
x^2 + a^2*d + (b^2*c + 2*a*b*d)*x)*log(b*x + a))/(b^4*d*g^2*x^3 + a^2*b^2*c
*g^2 + (b^4*c*g^2 + 2*a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2 + a^2*b^2*d*g^2)*x)
, x)) + A*d*i*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - B*c*i*
(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x
+ a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c
- a*b*d)*g^2)) - A*c*i/(b^2*g^2*x + a*b*g^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Adix+Aci+(Bdix+Bci)\log\left(\frac{bex+ae}{dx+c}\right)}{b^2g^2x^2+2\,abg^2x+a^2g^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorit
hm="fricas")
```

```
[Out] integral((A*d*i*x + A*c*i + (B*d*i*x + B*c*i)*log((b*e*x + a*e)/(d*x + c)))
/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{\left(bgx + ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorit
hm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^2,
 x)
```

3.7 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=85

$$-\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)}-\frac{Bi(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

```
[Out] -(B*i*(c + d*x)^2)/(4*(b*c - a*d)*g^3*(a + b*x)^2) - (i*(c + d*x)^2*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)*g^3*(a + b*x)^2)
```

Rubi [B] time = 0.281116, antiderivative size = 191, normalized size of antiderivative = 2.25, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 44}

$$-\frac{di\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^3(a+bx)}-\frac{i(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g^3(a+bx)^2}-\frac{Bd^2i\log(a+bx)}{2b^2g^3(bc-ad)}+\frac{Bd^2i\log(c+dx)}{2b^2g^3(bc-ad)}-\frac{Bi(bc-ad)}{4b^2g^3(a+bx)^2}-$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^3,x]
```

```
[Out] -(B*(b*c - a*d)*i)/(4*b^2*g^3*(a + b*x)^2) - (B*d*i)/(2*b^2*g^3*(a + b*x))
- (B*d^2*i*Log[a + b*x])/(2*b^2*(b*c - a*d)*g^3) - ((b*c - a*d)*i*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^3*(a + b*x)^2) - (d*i*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(b^2*g^3*(a + b*x)) + (B*d^2*i*Log[c + d*x])/(2*b^2*
(b*c - a*d)*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(7c+7dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx = \int \left(\frac{7(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^3(a+bx)^3}+\frac{7d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^3(a+bx)^2}\right)dx$$

$$= \frac{(7d)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{bg^3} + \frac{(7(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{bg^3}$$

$$= -\frac{7(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2} - \frac{7d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)} + \frac{(7Bd)\int \frac{bc-ad}{(a+bx)^2(c\ldots}}{b^2g^3}$$

$$= -\frac{7(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2} - \frac{7d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)} + \frac{(7Bd(bc-ad))\int \ldots}{b^2g\ldots}$$

$$= -\frac{7(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2} - \frac{7d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)} + \frac{(7Bd(bc-ad))\int \ldots}{\ldots}$$

$$= -\frac{7B(bc-ad)}{4b^2g^3(a+bx)^2} - \frac{7Bd}{2b^2g^3(a+bx)} - \frac{7Bd^2\log(a+bx)}{2b^2(bc-ad)g^3} - \frac{7(bc-ad)\left(A+B\log\left(\ldots\right.\right.}{2b^2g^3(a+bx)^2}$$

Mathematica [B] time = 0.162672, size = 208, normalized size = 2.45

$$\frac{i\left(-\frac{d\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2(a+bx)}-\frac{(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2(a+bx)^2}-\frac{B\left(-\frac{2d^2\log(a+bx)}{bc-ad}+\frac{2d^2\log(c+dx)}{bc-ad}+\frac{bc-ad}{(a+bx)^2}-\frac{2d}{a+bx}\right)}{4b^2}-\frac{Bd\left(\frac{d\log(a+bx)}{bc-ad}-\frac{d\log(c+dx)}{bc-ad}+\frac{1}{a+bx}\right)}{b^2}\right)}{g^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x
)^3,x]
```

```
[Out] (i*(-((b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*(a + b*x)^2)
 - (d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*(a + b*x)) - (B*d*((a + b*
x)^(-1) + (d*Log[a + b*x])/(b*c - a*d) - (d*Log[c + d*x])/(b*c - a*d)))/b^2
 - (B*((b*c - a*d)/(a + b*x)^2 - (2*d)/(a + b*x) - (2*d^2*Log[a + b*x])/(b*
c - a*d) + (2*d^2*Log[c + d*x])/(b*c - a*d)))/(4*b^2)))/g^3
```

Maple [B] time = 0.055, size = 394, normalized size = 4.6

$$\frac{de^2iAa}{2\,(ad-bc)^2\,g^3}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)\,d}\right)^{-2}-\frac{e^2iAbc}{2\,(ad-bc)^2\,g^3}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)\,d}\right)^{-2}+\frac{de^2iBa}{2\,(ad-bc)^2\,g^3}\ln\left(\frac{be}{d}+\ldots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x)
```

```
[Out] 1/2*e^2*d*i/(a*d-b*c)^2/g^3*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2*e
^2*i/(a*d-b*c)^2/g^3*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c+1/2*e^2*d*
```

```
i/(a*d-b*c)^2/g^3*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*a-1/2*e^2*i/(a*d-b*c)^2/g^3*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/4*e^2*d*i/(a*d-b*c)^2/g^3*B/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2*i/(a*d-b*c)^2/g^3*B/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c
```

Maxima [B] time = 1.37955, size = 770, normalized size = 9.06

$$-\frac{1}{4}\,Bdi\left(\frac{2\,(2\,bx+a)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{b^4g^3x^2+2\,ab^3g^3x+a^2b^2g^3}+\frac{3\,abc-a^2d+2\left(2\,b^2c-abd\right)x}{\left(b^5c-ab^4d\right)g^3x^2+2\left(ab^4c-a^2b^3d\right)g^3x+\left(a^2b^3c-a^3b^2d\right)g^3}+\frac{2\left(2\,bcd-ad^2\right)}{\left(b^4c^2-2\,ab^3c\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorit
hm="maxima")
```

```
[Out] -1/4*B*d*i*(2*(2*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^3*x^2
 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)
/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c -
a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d
+ a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*
c*d + a^2*b^2*d^2)*g^3)) + 1/4*B*c*i*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b
^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3)
- 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2
*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*
d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*(2*b*x +
a)*A*d*i/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*A*c*i/(b^3*g^3*x
^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] time = 1.08231, size = 366, normalized size = 4.31

$$-\frac{2\left(\left(2\,A+B\right)b^2cd-\left(2\,A+B\right)abd^2\right)ix+\left(\left(2\,A+B\right)b^2c^2-\left(2\,A+B\right)a^2d^2\right)i+2\left(Bb^2d^2ix^2+2\,Bb^2cdix+Bb^2c^2i\right)\log\left(\frac{be}{d}\right.}{4\left(\left(b^5c-ab^4d\right)g^3x^2+2\left(ab^4c-a^2b^3d\right)g^3x+\left(a^2b^3c-a^3b^2d\right)g^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorit
hm="fricas")
```

```
[Out] -1/4*(2*((2*A + B)*b^2*c*d - (2*A + B)*a*b*d^2)*i*x + ((2*A + B)*b^2*c^2 -
(2*A + B)*a^2*d^2)*i + 2*(B*b^2*d^2*i*x^2 + 2*B*b^2*c*d*i*x + B*b^2*c^2*i)*
log((b*e*x + a*e)/(d*x + c)))/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2
*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3)
```

Sympy [B] time = 6.21001, size = 382, normalized size = 4.49

$$-\frac{Bd^2i\log\left(x+\frac{-\frac{Ba^2d^4i}{ad-bc}+\frac{2Babcd^3i}{ad-bc}+Bad^3i-\frac{Bb^2c^2d^2i}{ad-bc}+Bbcd^2i}{2Bbd^3i}\right)}{2b^2g^3\left(ad-bc\right)}+\frac{Bd^2i\log\left(x+\frac{\frac{Ba^2d^4i}{ad-bc}-\frac{2Babcd^3i}{ad-bc}+Bad^3i+\frac{Bb^2c^2d^2i}{ad-bc}+Bbcd^2i}{2Bbd^3i}\right)}{2b^2g^3\left(ad-bc\right)}-\frac{2Aadi+2Abci}{4a^2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*d**2*i*log(x + (-B*a**2*d**4*i/(a*d - b*c) + 2*B*a*b*c*d**3*i/(a*d - b*c
) + B*a*d**3*i - B*b**2*c**2*d**2*i/(a*d - b*c) + B*b*c*d**2*i)/(2*B*b*d**3
*i))/(2*b**2*g**3*(a*d - b*c)) + B*d**2*i*log(x + (B*a**2*d**4*i/(a*d - b*c
) - 2*B*a*b*c*d**3*i/(a*d - b*c) + B*a*d**3*i + B*b**2*c**2*d**2*i/(a*d - b
*c) + B*b*c*d**2*i)/(2*B*b*d**3*i))/(2*b**2*g**3*(a*d - b*c)) - (2*A*a*d*i
+ 2*A*b*c*i + B*a*d*i + B*b*c*i + x*(4*A*b*d*i + 2*B*b*d*i))/(4*a**2*b**2*g
**3 + 8*a*b**3*g**3*x + 4*b**4*g**3*x**2) + (-B*a*d*i - B*b*c*i - 2*B*b*d*i
*x)*log(e*(a + b*x)/(c + d*x))/(2*a**2*b**2*g**3 + 4*a*b**3*g**3*x + 2*b**4
*g**3*x**2)
```

Giac [B] time = 1.35108, size = 286, normalized size = 3.36

$$\frac{Bd^2\log(bx+a)}{2\left(b^3cg^3i-ab^2dg^3i\right)}-\frac{Bd^2\log(dx+c)}{2\left(b^3cg^3i-ab^2dg^3i\right)}-\frac{(2\,Bbdix+Bbci+Badi)\log\left(\frac{bx+a}{dx+c}\right)}{2\left(b^4g^3x^2+2\,ab^3g^3x+a^2b^2g^3\right)}-\frac{4\,Abdix+6\,Bbdix+2\,Abci+3\,Bbci}{4\left(b^4g^3x^2+2\,ab^3g^3x+a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorit
hm="giac")
```

```
[Out] 1/2*B*d^2*log(b*x + a)/(b^3*c*g^3*i - a*b^2*d*g^3*i) - 1/2*B*d^2*log(d*x +
c)/(b^3*c*g^3*i - a*b^2*d*g^3*i) - 1/2*(2*B*b*d*i*x + B*b*c*i + B*a*d*i)*lo
g((b*x + a)/(d*x + c))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/4*(4
*A*b*d*i*x + 6*B*b*d*i*x + 2*A*b*c*i + 3*B*b*c*i + 2*A*a*d*i + 3*B*a*d*i)/(
b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3)
```

3.8 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=173

$$-\frac{bi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4(a+bx)^3(bc-ad)^2}+\frac{di(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^4(a+bx)^2(bc-ad)^2}-\frac{bBi(c+dx)^3}{9g^4(a+bx)^3(bc-ad)^2}+\frac{Bdi(c+dx)^2}{4g^4(a+bx)^2(bc-a}$$

```
[Out] (B*d*i*(c + d*x)^2)/(4*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*B*i*(c + d*x)^3)
/(9*(b*c - a*d)^2*g^4*(a + b*x)^3) + (d*i*(c + d*x)^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*i*(c + d*x)^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Rubi [A] time = 0.341942, antiderivative size = 225, normalized size of antiderivative = 1.3, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 44}

$$-\frac{di\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g^4(a+bx)^2}-\frac{i(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^2g^4(a+bx)^3}+\frac{Bd^2i}{6b^2g^4(a+bx)(bc-ad)}+\frac{Bd^3i\log(a+bx)}{6b^2g^4(bc-ad)^2}-\frac{Bd^3i\log(c}{6b^2g^4(bc-}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^4,x]
```

```
[Out] -(B*(b*c - a*d)*i)/(9*b^2*g^4*(a + b*x)^3) - (B*d*i)/(12*b^2*g^4*(a + b*x)^
2) + (B*d^2*i)/(6*b^2*(b*c - a*d)*g^4*(a + b*x)) + (B*d^3*i*Log[a + b*x])/(
6*b^2*(b*c - a*d)^2*g^4) - ((b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/(3*b^2*g^4*(a + b*x)^3) - (d*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
2*b^2*g^4*(a + b*x)^2) - (B*d^3*i*Log[c + d*x])/(6*b^2*(b*c - a*d)^2*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(8c+8dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx = \int \left(\frac{8(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^4(a+bx)^4}+\frac{8d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^4(a+bx)^3}\right)dx$$

$$= \frac{(8d)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{bg^4} + \frac{(8(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{bg^4}$$

$$= -\frac{8(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2g^4(a+bx)^3} - \frac{4d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^4(a+bx)^2} + \frac{(4Bd)\int \frac{bc-ad}{(a+bx)^3(c\cdots}}{b^2g^4}$$

$$= -\frac{8(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2g^4(a+bx)^3} - \frac{4d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^4(a+bx)^2} + \frac{(4Bd(bc-ad))\int\cdots}{b^2\cdots}$$

$$= -\frac{8(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2g^4(a+bx)^3} - \frac{4d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^4(a+bx)^2} + \frac{(4Bd(bc-ad))\int\cdots}{\cdots}$$

$$= -\frac{8B(bc-ad)}{9b^2g^4(a+bx)^3} - \frac{2Bd}{3b^2g^4(a+bx)^2} + \frac{4Bd^2}{3b^2(bc-ad)g^4(a+bx)} + \frac{4Bd^3\log(a+bx\cdots}{3b^2(bc-ad)^2g^4\cdots}$$

Mathematica [A] time = 0.397522, size = 187, normalized size = 1.08

$$-\frac{i\left(\frac{12Abc}{(a+bx)^3}+\frac{18Ad}{(a+bx)^2}-\frac{12aAd}{(a+bx)^3}-\frac{6Bd^2}{(a+bx)(bc-ad)}-\frac{6Bd^3\log(a+bx)}{(bc-ad)^2}+\frac{6Bd^3\log(c+dx)}{(bc-ad)^2}+\frac{6B(ad+2bc+3bdx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}+\frac{4bBc}{(a+bx)^3}+\frac{3Bd}{(a+bx)^2}-\cdots\right.}{36b^2g^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x
)^4,x]
```

```
[Out] -(i*((12*A*b*c)/(a + b*x)^3 + (4*b*B*c)/(a + b*x)^3 - (12*a*A*d)/(a + b*x)^
3 - (4*a*B*d)/(a + b*x)^3 + (18*A*d)/(a + b*x)^2 + (3*B*d)/(a + b*x)^2 - (6
*B*d^2)/((b*c - a*d)*(a + b*x)) - (6*B*d^3*Log[a + b*x])/(b*c - a*d)^2 + (6
*B*(2*b*c + a*d + 3*b*d*x)*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^3 + (6*B
*d^3*Log[c + d*x])/(b*c - a*d)^2))/(36*b^2*g^4)
```

Maple [B] time = 0.052, size = 804, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x)
```

```
[Out] 1/2*e^2*d^2*i/(a*d-b*c)^3/g^4*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2
*e^2*d*i/(a*d-b*c)^3/g^4*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-1/3*e^
3*d*i/(a*d-b*c)^3/g^4*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+1/3*e^3*i
```

```
/(a*d-b*c)^3/g^4*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/2*e^2*d^2*
i/(a*d-b*c)^3/g^4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*a-1/2*e^2*d*i/(a*d-b*c)^3/g^4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/4*e^2*d^2*i/(a*d-b*c)^3/g^4
*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2*d*i/(a*d-b*c)^3/g^4*B/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-1/3*e^3*d*i/(a*d-b*c)^3/g^4*B*b/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/3*e^
3*i/(a*d-b*c)^3/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*c-1/9*e^3*d*i/(a*d-b*c)^3/g^4*B*b/(b*e/d+e/(d*x+c)*a-e
/d/(d*x+c)*b*c)^3*a+1/9*e^3*i/(a*d-b*c)^3/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/
(d*x+c)*b*c)^3*c
```

Maxima [B] time = 2.00435, size = 1260, normalized size = 7.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorit
hm="maxima")
```

```
[Out] -1/36*B*d*i*(6*(3*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^4*x^
3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + (5*a*b^2*c^2 - 22*a^
2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b
^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3
*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3
*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)
*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^
2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*
c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/18*B*c*i*((6
*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)
*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b
^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^
2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*log(b*e*x/(d*
x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x +
a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2
 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b
^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/6*(3*b*x + a)*A*d*i/(b^5*g^4*x^3 + 3*a*b^4*
g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*A*c*i/(b^4*g^4*x^3 + 3*a*b^3
*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 1.05242, size = 747, normalized size = 4.32

$$\frac{6\left(Bb^3cd^2 - Bab^2d^3\right)ix^2 - 3\left((6A + B)b^3c^2d - 6(2A + B)ab^2cd^2 + (6A + 5B)a^2bd^3\right)ix - \left(4(3A + B)b^3c^3 - 9(2A + B\right.}{36\left(\left(b^7c^2 - 2ab^6cd + a^2b^5d^2\right)g^4x^3 + 3\left(ab^6c^2 - 2a^2b^5cd + a^3b^4d^2\right)g^4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorit
hm="fricas")
```

```
[Out] 1/36*(6*(B*b^3*c*d^2 - B*a*b^2*d^3)*i*x^2 - 3*((6*A + B)*b^3*c^2*d - 6*(2*A
 + B)*a*b^2*c*d^2 + (6*A + 5*B)*a^2*b*d^3)*i*x - (4*(3*A + B)*b^3*c^3 - 9*(
2*A + B)*a*b^2*c^2*d + (6*A + 5*B)*a^3*d^3)*i + 6*(B*b^3*d^3*i*x^3 + 3*B*a*
```

```
b^2*d^3*i*x^2 - 3*(B*b^3*c^2*d - 2*B*a*b^2*c*d^2)*i*x - (2*B*b^3*c^3 - 3*B*
a*b^2*c^2*d)*i)*log((b*e*x + a*e)/(d*x + c)))/((b^7*c^2 - 2*a*b^6*c*d + a^2
*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3
*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b
^3*c*d + a^5*b^2*d^2)*g^4)
```

Sympy [B] time = 11.3072, size = 629, normalized size = 3.64

$$-\frac{Bd^3 i \log\left(x + \frac{-\frac{Ba^3d^6i}{(ad-bc)^2} + \frac{3Ba^2bcd^5i}{(ad-bc)^2} - \frac{3Bab^2c^2d^4i}{(ad-bc)^2} + Bad^4i + \frac{Bb^3c^3d^3i}{(ad-bc)^2} + Bbcd^3i}{2Bbd^4i}\right)}{6b^2g^4(ad-bc)^2} + \frac{Bd^3 i \log\left(x + \frac{\frac{Ba^3d^6i}{(ad-bc)^2} - \frac{3Ba^2bcd^5i}{(ad-bc)^2} + \frac{3Bab^2c^2d^4i}{(ad-bc)^2} + Bad^4i - \frac{Bb^3c^3d^3i}{(ad-bc)^2} + Bbcd^3i}{2Bbd^4i}\right)}{6b^2g^4(ad-bc)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*d**3*i*log(x + (-B*a**3*d**6*i/(a*d - b*c)**2 + 3*B*a**2*b*c*d**5*i/(a*d
 - b*c)**2 - 3*B*a*b**2*c**2*d**4*i/(a*d - b*c)**2 + B*a*d**4*i + B*b**3*c*
*3*d**3*i/(a*d - b*c)**2 + B*b*c*d**3*i)/(2*B*b*d**4*i))/(6*b**2*g**4*(a*d
- b*c)**2) + B*d**3*i*log(x + (B*a**3*d**6*i/(a*d - b*c)**2 - 3*B*a**2*b*c*
d**5*i/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d**4*i/(a*d - b*c)**2 + B*a*d**4*i
- B*b**3*c**3*d**3*i/(a*d - b*c)**2 + B*b*c*d**3*i)/(2*B*b*d**4*i))/(6*b**2
*g**4*(a*d - b*c)**2) + (-B*a*d*i - 2*B*b*c*i - 3*B*b*d*i*x)*log(e*(a + b*x
)/(c + d*x))/(6*a**3*b**2*g**4 + 18*a**2*b**3*g**4*x + 18*a*b**4*g**4*x**2
+ 6*b**5*g**4*x**3) - (6*A*a**2*d**2*i + 6*A*a*b*c*d*i - 12*A*b**2*c**2*i +
 5*B*a**2*d**2*i + 5*B*a*b*c*d*i - 4*B*b**2*c**2*i + 6*B*b**2*d**2*i*x**2 +
 x*(18*A*a*b*d**2*i - 18*A*b**2*c*d*i + 15*B*a*b*d**2*i - 3*B*b**2*c*d*i))/
(36*a**4*b**2*d*g**4 - 36*a**3*b**3*c*g**4 + x**3*(36*a*b**5*d*g**4 - 36*b*
*6*c*g**4) + x**2*(108*a**2*b**4*d*g**4 - 108*a*b**5*c*g**4) + x*(108*a**3*
b**3*d*g**4 - 108*a**2*b**4*c*g**4))
```

Giac [B] time = 1.39268, size = 544, normalized size = 3.14

$$-\frac{Bd^3\log(bx+a)}{6\left(b^4c^2g^4i - 2\,ab^3cdg^4i + a^2b^2d^2g^4i\right)} + \frac{Bd^3\log(dx+c)}{6\left(b^4c^2g^4i - 2\,ab^3cdg^4i + a^2b^2d^2g^4i\right)} - \frac{(3\,Bbdix + 2\,Bbci + Badi)\log\left(\frac{bx+a}{dx+c}\right)}{6\left(b^5g^4x^3 + 3\,ab^4g^4x^2 + 3\,a^2b^3g^4x + a^3b^2 \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorit
hm="giac")
```

```
[Out] -1/6*B*d^3*log(b*x + a)/(b^4*c^2*g^4*i - 2*a*b^3*c*d*g^4*i + a^2*b^2*d^2*g^
4*i) + 1/6*B*d^3*log(d*x + c)/(b^4*c^2*g^4*i - 2*a*b^3*c*d*g^4*i + a^2*b^2*
d^2*g^4*i) - 1/6*(3*B*b*d*i*x + 2*B*b*c*i + B*a*d*i)*log((b*x + a)/(d*x + c
))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + 1/36*(
6*B*b^2*d^2*i*x^2 - 18*A*b^2*c*d*i*x - 21*B*b^2*c*d*i*x + 18*A*a*b*d^2*i*x
+ 33*B*a*b*d^2*i*x - 12*A*b^2*c^2*i - 16*B*b^2*c^2*i + 6*A*a*b*c*d*i + 11*B
*a*b*c*d*i + 6*A*a^2*d^2*i + 11*B*a^2*d^2*i)/(b^6*c*g^4*x^3 - a*b^5*d*g^4*x
^3 + 3*a*b^5*c*g^4*x^2 - 3*a^2*b^4*d*g^4*x^2 + 3*a^2*b^4*c*g^4*x - 3*a^3*b^
3*d*g^4*x + a^3*b^3*c*g^4 - a^4*b^2*d*g^4)
```

3.9 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=269

$$-\frac{b^2i(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^5(a+bx)^2(bc-ad)^3}+\frac{2bdi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^3}-\frac{\cdots}{16g^5(\cdots}$$

```
[Out] -(B*d^2*i*(c + d*x)^2)/(4*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*B*d*i*(c +
d*x)^3)/(9*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*B*i*(c + d*x)^4)/(16*(b*c
- a*d)^3*g^5*(a + b*x)^4) - (d^2*i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*d*i*(c + d*x)^3*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*i*(c
 + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*(b*c - a*d)^3*g^5*(a + b
*x)^4)
```

Rubi [A] time = 0.389584, antiderivative size = 257, normalized size of antiderivative = 0.96, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 44}

$$-\frac{di\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^2g^5(a+bx)^3}-\frac{i(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^2g^5(a+bx)^4}-\frac{Bd^3i}{12b^2g^5(a+bx)(bc-ad)^2}+\frac{Bd^2i}{24b^2g^5(a+bx)^2(bc-ad)}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^5,x]
```

```
[Out] -(B*(b*c - a*d)*i)/(16*b^2*g^5*(a + b*x)^4) - (B*d*i)/(36*b^2*g^5*(a + b*x)
^3) + (B*d^2*i)/(24*b^2*(b*c - a*d)*g^5*(a + b*x)^2) - (B*d^3*i)/(12*b^2*(b
*c - a*d)^2*g^5*(a + b*x)) - (B*d^4*i*Log[a + b*x])/(12*b^2*(b*c - a*d)^3*g
^5) - ((b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b^2*g^5*(a +
b*x)^4) - (d*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2*g^5*(a + b*x)^3
) + (B*d^4*i*Log[c + d*x])/(12*b^2*(b*c - a*d)^3*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(9c+9dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}dx = \int \left(\frac{9(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^5(a+bx)^5}+\frac{9d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^5(a+bx)^4}\right)dx$$

$$= \frac{(9d)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}dx}{bg^5}+\frac{(9(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5}dx}{bg^5}$$

$$= -\frac{9(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2g^5(a+bx)^4}-\frac{3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^5(a+bx)^3}+\frac{(3Bd)\int \frac{bc-ad}{(a+bx)^4(c\cdots}}{b^2g^5}$$

$$= -\frac{9(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2g^5(a+bx)^4}-\frac{3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^5(a+bx)^3}+\frac{(3Bd(bc-ad))\int \cdots}{b^2g\cdots}$$

$$= -\frac{9(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b^2g^5(a+bx)^4}-\frac{3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^5(a+bx)^3}+\frac{(3Bd(bc-ad))\int \cdots}{\cdots}$$

$$= -\frac{9B(bc-ad)}{16b^2g^5(a+bx)^4}-\frac{Bd}{4b^2g^5(a+bx)^3}+\frac{3Bd^2}{8b^2(bc-ad)g^5(a+bx)^2}-\frac{3Bd^3}{4b^2(bc-ad)^2g\cdots}$$

Mathematica [A] time = 0.458856, size = 210, normalized size = 0.78

$$-\frac{i\left(\frac{36Abc}{(a+bx)^4}+\frac{48Ad}{(a+bx)^3}-\frac{36aAd}{(a+bx)^4}+\frac{12Bd^3}{(a+bx)(bc-ad)^2}-\frac{6Bd^2}{(a+bx)^2(bc-ad)}+\frac{12Bd^4\log(a+bx)}{(bc-ad)^3}-\frac{12Bd^4\log(c+dx)}{(bc-ad)^3}+\frac{12B(ad+3bc+4bdx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}+\cdots\right)}{144b^2g^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x
)^5,x]
```

```
[Out] -(i*((36*A*b*c)/(a + b*x)^4 + (9*b*B*c)/(a + b*x)^4 - (36*a*A*d)/(a + b*x)^
4 - (9*a*B*d)/(a + b*x)^4 + (48*A*d)/(a + b*x)^3 + (4*B*d)/(a + b*x)^3 - (6
*B*d^2)/((b*c - a*d)*(a + b*x)^2) + (12*B*d^3)/((b*c - a*d)^2*(a + b*x)) +
(12*B*d^4*Log[a + b*x])/(b*c - a*d)^3 + (12*B*(3*b*c + a*d + 4*b*d*x)*Log[(
e*(a + b*x))/(c + d*x)])/(a + b*x)^4 - (12*B*d^4*Log[c + d*x])/(b*c - a*d)^
3))/(144*b^2*g^5)
```

Maple [B] time = 0.051, size = 1226, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x)
```

```
[Out] 1/2*e^2*d^3*i/(a*d-b*c)^4/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2
*e^2*d^2*i/(a*d-b*c)^4/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-2/3*
e^3*d^2*i/(a*d-b*c)^4/g^5*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+2/3*e
^3*d*i/(a*d-b*c)^4/g^5*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/4*e^
4*d*i/(a*d-b*c)^4/g^5*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/4*e^4
*i/(a*d-b*c)^4/g^5*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+1/2*e^2*d^
3*i/(a*d-b*c)^4/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*a-1/2*e^2*d^2*i/(a*d-b*c)^4/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/4*e^2*d^3*i/(a*d-b*c)^4
/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2*d^2*i/(a*d-b*c)^4/g^
5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-2/3*e^3*d^2*i/(a*d-b*c)^4/g^5
*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
a+2/3*e^3*d*i/(a*d-b*c)^4/g^5*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/9*e^3*d^2*i/(a*d-b*c)^4/g^5*B*b/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+2/9*e^3*d*i/(a*d-b*c)^4/g^5*B*b^2/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/4*e^4*d*i/(a*d-b*c)^4/g^5*B*b^2/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/4*e^4*i/(a*
d-b*c)^4/g^5*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))*c+1/16*e^4*d*i/(a*d-b*c)^4/g^5*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)^4*a-1/16*e^4*i/(a*d-b*c)^4/g^5*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^4*c
```

Maxima [B] time = 1.80358, size = 1871, normalized size = 6.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorit
hm="maxima")
```

```
[Out] -1/144*B*d*i*(12*(4*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*
x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5)
+ (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4
*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*
x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/(
(b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^
8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b
^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*
b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5
*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^
3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a
^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^
6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*
g^5)) + 1/48*B*c*i*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b
*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*
b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 -
a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a
^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 -
a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 -
 a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^
7*b*d^3)*g^5) - 12*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*
b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log
(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 +
 a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^
3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/12*(4*b*x + a)*A*d*i/(b^
6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2
```

```
*g^5) - 1/4*A*c*i/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^
3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 1.08386, size = 1230, normalized size = 4.57

$$-\frac{12\left(Bb^4cd^3 - Bab^3d^4\right)ix^3 - 6\left(Bb^4c^2d^2 - 8\,Bab^3cd^3 + 7\,Ba^2b^2d^4\right)ix^2 + 4\left((12\,A + B)b^4c^3d - 6\,(6\,A + B)ab^3c^2d^2 + 18\,(2\,A}{144\left(\left(b^9c^3 - 3\,ab^8c^2d + 3\,a^2b^7cd^2 - a^3b^6d^3\right)g^5x^4 +}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorit
hm="fricas")
```

```
[Out] -1/144*(12*(B*b^4*c*d^3 - B*a*b^3*d^4)*i*x^3 - 6*(B*b^4*c^2*d^2 - 8*B*a*b^3
*c*d^3 + 7*B*a^2*b^2*d^4)*i*x^2 + 4*((12*A + B)*b^4*c^3*d - 6*(6*A + B)*a*b
^3*c^2*d^2 + 18*(2*A + B)*a^2*b^2*c*d^3 - (12*A + 13*B)*a^3*b*d^4)*i*x + (9
*(4*A + B)*b^4*c^4 - 32*(3*A + B)*a*b^3*c^3*d + 36*(2*A + B)*a^2*b^2*c^2*d^
2 - (12*A + 13*B)*a^4*d^4)*i + 12*(B*b^4*d^4*i*x^4 + 4*B*a*b^3*d^4*i*x^3 +
6*B*a^2*b^2*d^4*i*x^2 + 4*(B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2 + 3*B*a^2*b^2*c*
d^3)*i*x + (3*B*b^4*c^4 - 8*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2)*i)*log((b*
e*x + a*e)/(d*x + c)))/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^
6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5
*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^
4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b
^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*
d^3)*g^5)
```

Sympy [B] time = 18.9915, size = 928, normalized size = 3.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*d**4*i*log(x + (-B*a**4*d**8*i/(a*d - b*c)**3 + 4*B*a**3*b*c*d**7*i/(a*d
 - b*c)**3 - 6*B*a**2*b**2*c**2*d**6*i/(a*d - b*c)**3 + 4*B*a*b**3*c**3*d**
5*i/(a*d - b*c)**3 + B*a*d**5*i - B*b**4*c**4*d**4*i/(a*d - b*c)**3 + B*b*c
*d**4*i)/(2*B*b*d**5*i))/(12*b**2*g**5*(a*d - b*c)**3) + B*d**4*i*log(x + (
B*a**4*d**8*i/(a*d - b*c)**3 - 4*B*a**3*b*c*d**7*i/(a*d - b*c)**3 + 6*B*a**
2*b**2*c**2*d**6*i/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**5*i/(a*d - b*c)**3 +
 B*a*d**5*i + B*b**4*c**4*d**4*i/(a*d - b*c)**3 + B*b*c*d**4*i)/(2*B*b*d**5
*i))/(12*b**2*g**5*(a*d - b*c)**3) + (-B*a*d*i - 3*B*b*c*i - 4*B*b*d*i*x)*l
og(e*(a + b*x)/(c + d*x))/(12*a**4*b**2*g**5 + 48*a**3*b**3*g**5*x + 72*a**
2*b**4*g**5*x**2 + 48*a*b**5*g**5*x**3 + 12*b**6*g**5*x**4) - (12*A*a**3*d*
*3*i + 12*A*a**2*b*c*d**2*i - 60*A*a*b**2*c**2*d*i + 36*A*b**3*c**3*i + 13*
B*a**3*d**3*i + 13*B*a**2*b*c*d**2*i - 23*B*a*b**2*c**2*d*i + 9*B*b**3*c**3
*i + 12*B*b**3*d**3*i*x**3 + x**2*(42*B*a*b**2*d**3*i - 6*B*b**3*c*d**2*i)
+ x*(48*A*a**2*b*d**3*i - 96*A*a*b**2*c*d**2*i + 48*A*b**3*c**2*d*i + 52*B*
a**2*b*d**3*i - 20*B*a*b**2*c*d**2*i + 4*B*b**3*c**2*d*i))/(144*a**6*b**2*d
**2*g**5 - 288*a**5*b**3*c*d*g**5 + 144*a**4*b**4*c**2*g**5 + x**4*(144*a**
2*b**6*d**2*g**5 - 288*a*b**7*c*d*g**5 + 144*b**8*c**2*g**5) + x**3*(576*a*
*3*b**5*d**2*g**5 - 1152*a**2*b**6*c*d*g**5 + 576*a*b**7*c**2*g**5) + x**2*
(864*a**4*b**4*d**2*g**5 - 1728*a**3*b**5*c*d*g**5 + 864*a**2*b**6*c**2*g**
```

```
5) + x*(576*a**5*b**3*d**2*g**5 - 1152*a**4*b**4*c*d*g**5 + 576*a**3*b**5*c
**2*g**5))
```

Giac [B] time = 1.40809, size = 905, normalized size = 3.36

$$\frac{Bd^4\log(bx+a)}{12\left(b^5c^3g^5i-3\,ab^4c^2dg^5i+3\,a^2b^3cd^2g^5i-a^3b^2d^3g^5i\right)}-\frac{Bd^4\log(dx+c)}{12\left(b^5c^3g^5i-3\,ab^4c^2dg^5i+3\,a^2b^3cd^2g^5i-a^3b^2d^3g^5i\right)}-\frac{}{12\left(b^{\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorit
hm="giac")
```

```
[Out] 1/12*B*d^4*log(b*x + a)/(b^5*c^3*g^5*i - 3*a*b^4*c^2*d*g^5*i + 3*a^2*b^3*c*
d^2*g^5*i - a^3*b^2*d^3*g^5*i) - 1/12*B*d^4*log(d*x + c)/(b^5*c^3*g^5*i - 3
*a*b^4*c^2*d*g^5*i + 3*a^2*b^3*c*d^2*g^5*i - a^3*b^2*d^3*g^5*i) - 1/12*(4*B
*b*d*i*x + 3*B*b*c*i + B*a*d*i)*log((b*x + a)/(d*x + c))/(b^6*g^5*x^4 + 4*a
*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + 1/144*(
12*B*b^3*d^3*x^3 - 6*B*b^3*c*d^2*x^2 + 42*B*a*b^2*d^3*x^2 + 48*A*b^3*c^2*d*
x + 52*B*b^3*c^2*d*x - 96*A*a*b^2*c*d^2*x - 116*B*a*b^2*c*d^2*x + 48*A*a^2*
b*d^3*x + 100*B*a^2*b*d^3*x + 36*A*b^3*c^3 + 45*B*b^3*c^3 - 60*A*a*b^2*c^2*
d - 83*B*a*b^2*c^2*d + 12*A*a^2*b*c*d^2 + 25*B*a^2*b*c*d^2 + 12*A*a^3*d^3 +
 25*B*a^3*d^3)/(b^8*c^2*g^5*i*x^4 - 2*a*b^7*c*d*g^5*i*x^4 + a^2*b^6*d^2*g^5
*i*x^4 + 4*a*b^7*c^2*g^5*i*x^3 - 8*a^2*b^6*c*d*g^5*i*x^3 + 4*a^3*b^5*d^2*g^
5*i*x^3 + 6*a^2*b^6*c^2*g^5*i*x^2 - 12*a^3*b^5*c*d*g^5*i*x^2 + 6*a^4*b^4*d^
2*g^5*i*x^2 + 4*a^3*b^5*c^2*g^5*i*x - 8*a^4*b^4*c*d*g^5*i*x + 4*a^5*b^3*d^2
*g^5*i*x + a^4*b^4*c^2*g^5*i - 2*a^5*b^3*c*d*g^5*i + a^6*b^2*d^2*g^5*i)
```

3.10 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx$

Optimal. Leaf size=423

$$-\frac{3b^2g^3i^2(c+dx)^5(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^4}+\frac{b^3g^3i^2(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6d^4}-\frac{g^3i^2(c+dx)^3(bc-ad)^3\left(B\log\right.}{3d^4}$$

```
[Out] (B*(b*c - a*d)^5*g^3*i^2*x)/(60*b^2*d^3) + (B*(b*c - a*d)^4*g^3*i^2*(c + d*
x)^2)/(120*b*d^4) - (19*B*(b*c - a*d)^3*g^3*i^2*(c + d*x)^3)/(180*d^4) + (1
3*b*B*(b*c - a*d)^2*g^3*i^2*(c + d*x)^4)/(120*d^4) - (b^2*B*(b*c - a*d)*g^3
*i^2*(c + d*x)^5)/(30*d^4) + (B*(b*c - a*d)^6*g^3*i^2*Log[(a + b*x)/(c + d*
x)])/(60*b^3*d^4) - ((b*c - a*d)^3*g^3*i^2*(c + d*x)^3*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(3*d^4) + (3*b*(b*c - a*d)^2*g^3*i^2*(c + d*x)^4*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(4*d^4) - (3*b^2*(b*c - a*d)*g^3*i^2*(c + d*x
)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*d^4) + (b^3*g^3*i^2*(c + d*x)^
6*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*d^4) + (B*(b*c - a*d)^6*g^3*i^2*
Log[c + d*x])/(60*b^3*d^4)
```

Rubi [A] time = 0.655071, antiderivative size = 330, normalized size of antiderivative = 0.78, number of steps used = 14, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 43}

$$\frac{d^2g^3i^2(a+bx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6b^3}+\frac{g^3i^2(a+bx)^4(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^3}+\frac{2dg^3i^2(a+bx)^5(bc-ad)\left(B\log\left(\right.\right.}{5b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^5*g^3*i^2*x)/(60*b^2*d^3) + (B*(b*c - a*d)^4*g^3*i^2*(a + b
*x)^2)/(120*b^3*d^2) - (B*(b*c - a*d)^3*g^3*i^2*(a + b*x)^3)/(180*b^3*d) -
(7*B*(b*c - a*d)^2*g^3*i^2*(a + b*x)^4)/(120*b^3) - (B*d*(b*c - a*d)*g^3*i^
2*(a + b*x)^5)/(30*b^3) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(4*b^3) + (2*d*(b*c - a*d)*g^3*i^2*(a + b*x)^5*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b^3) + (d^2*g^3*i^2*(a + b*x)^6*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(6*b^3) + (B*(b*c - a*d)^6*g^3*i^2*Log[c +
d*x])/(60*b^3*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (10c+10dx)^2(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{100(bc-ad)^2(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2}+\frac{200d\ldots}{\ldots}\right.$$

$$=\frac{\left(100(bc-ad)^2\right)\int(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b^2}+\frac{(1\ldots}{\ldots}$$

$$=\frac{25(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3}+\frac{40d(bc-a\ldots}{\ldots}$$

$$=\frac{25(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3}+\frac{40d(bc-a\ldots}{\ldots}$$

$$=\frac{25(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3}+\frac{40d(bc-a\ldots}{\ldots}$$

$$=-\frac{5B(bc-ad)^5g^3x}{3b^2d^3}+\frac{5B(bc-ad)^4g^3(a+bx)^2}{6b^3d^2}-\frac{5B(bc-a\ldots}{9\ldots}$$

Mathematica [A] time = 0.351404, size = 429, normalized size = 1.01

$$\frac{g^3i^2\left(60d^6(a+bx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+144d^5(a+bx)^5(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+90d^4(a+bx)^4(bc-ad)^2\left(B\ldots\right.\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)]),x]
```

```
[Out] (g^3*i^2*(90*d^4*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*
x)]) + 144*d^5*(b*c - a*d)*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])
 + 60*d^6*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 15*B*(b*c - a*
d)^3*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a +
 b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^2*(12*b*d*(b*c -
 a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3
 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) - B*(b*c - a*d)*(60*b
*d*(b*c - a*d)^4*x + 30*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 20*d^3*(b*c - a*
d)^2*(a + b*x)^3 + 15*d^4*(-(b*c) + a*d)*(a + b*x)^4 + 12*d^5*(a + b*x)^5 -
 60*(b*c - a*d)^5*Log[c + d*x])))/(360*b^3*d^4)
```

Maple [B] time = 0.242, size = 9298, normalized size = 22.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.80372, size = 2415, normalized size = 5.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="maxima")
```

```
[Out] 1/6*A*b^3*d^2*g^3*i^2*x^6 + 2/5*A*b^3*c*d*g^3*i^2*x^5 + 3/5*A*a*b^2*d^2*g^3
*i^2*x^5 + 1/4*A*b^3*c^2*g^3*i^2*x^4 + 3/2*A*a*b^2*c*d*g^3*i^2*x^4 + 3/4*A*
a^2*b*d^2*g^3*i^2*x^4 + A*a*b^2*c^2*g^3*i^2*x^3 + 2*A*a^2*b*c*d*g^3*i^2*x^3
 + 1/3*A*a^3*d^2*g^3*i^2*x^3 + 3/2*A*a^2*b*c^2*g^3*i^2*x^2 + A*a^3*c*d*g^3*
i^2*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*lo
g(d*x + c)/d)*B*a^3*c^2*g^3*i^2 + 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x +
 c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B
*a^2*b*c^2*g^3*i^2 + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2*c^2*g^3*i^2 + 1/24*(6*x^4*log(b*e
*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)
/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(
b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*c^2*g^3*i^2 + (x^2*log(b*e*x/(d*x +
c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c -
a*d)*x/(b*d))*B*a^3*c*d*g^3*i^2 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c
)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)
*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^2*b*c*d*g^3*i^2 + 1/4*(6*x^4
*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(
d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x
^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*b^2*c*d*g^3*i^2 + 1/30*(12*x^5
*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*lo
g(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*
d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d
^4))*B*b^3*c*d*g^3*i^2 + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
- 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^3*d^2*g^3*i^2 + 1/8*(6*x^4*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c
)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*
(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a^2*b*d^2*g^3*i^2 + 1/20*(12*x^5*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x +
 c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^
3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*
a*b^2*d^2*g^3*i^2 + 1/360*(60*x^6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60
*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^
5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5
)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5
))*B*b^3*d^2*g^3*i^2 + A*a^3*c^2*g^3*i^2*x
```

Fricas [A] time = 1.76867, size = 1509, normalized size = 3.57

$$\frac{60\,Ab^6d^6g^3i^2x^6 + 12\left((12\,A - B)b^6cd^5 + (18\,A + B)ab^5d^6\right)g^3i^2x^5 + 3\left((30\,A - 7\,B)b^6c^2d^4 + 6\,(30\,A - B)ab^5cd^5 + (90\,A\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="fricas")
```

```
[Out] 1/360*(60*A*b^6*d^6*g^3*i^2*x^6 + 12*((12*A - B)*b^6*c*d^5 + (18*A + B)*a*b
^5*d^6)*g^3*i^2*x^5 + 3*((30*A - 7*B)*b^6*c^2*d^4 + 6*(30*A - B)*a*b^5*c*d^
5 + (90*A + 13*B)*a^2*b^4*d^6)*g^3*i^2*x^4 - 2*(B*b^6*c^3*d^3 - 3*(60*A - 1
3*B)*a*b^5*c^2*d^4 - 3*(120*A + 7*B)*a^2*b^4*c*d^5 - (60*A + 19*B)*a^3*b^3*
d^6)*g^3*i^2*x^3 + 3*(B*b^6*c^4*d^2 - 6*B*a*b^5*c^3*d^3 + 30*(6*A - B)*a^2*
b^4*c^2*d^4 + 2*(60*A + 17*B)*a^3*b^3*c*d^5 + B*a^4*b^2*d^6)*g^3*i^2*x^2 -
6*(B*b^6*c^5*d - 6*B*a*b^5*c^4*d^2 + 15*B*a^2*b^4*c^3*d^3 - 5*(12*A + B)*a^
3*b^3*c^2*d^4 - 6*B*a^4*b^2*c*d^5 + B*a^5*b*d^6)*g^3*i^2*x + 6*(15*B*a^4*b^
2*c^2*d^4 - 6*B*a^5*b*c*d^5 + B*a^6*d^6)*g^3*i^2*log(b*x + a) + 6*(B*b^6*c^
6 - 6*B*a*b^5*c^5*d + 15*B*a^2*b^4*c^4*d^2 - 20*B*a^3*b^3*c^3*d^3)*g^3*i^2*
log(d*x + c) + 6*(10*B*b^6*d^6*g^3*i^2*x^6 + 60*B*a^3*b^3*c^2*d^4*g^3*i^2*x
 + 12*(2*B*b^6*c*d^5 + 3*B*a*b^5*d^6)*g^3*i^2*x^5 + 15*(B*b^6*c^2*d^4 + 6*B
*a*b^5*c*d^5 + 3*B*a^2*b^4*d^6)*g^3*i^2*x^4 + 20*(3*B*a*b^5*c^2*d^4 + 6*B*a
^2*b^4*c*d^5 + B*a^3*b^3*d^6)*g^3*i^2*x^3 + 30*(3*B*a^2*b^4*c^2*d^4 + 2*B*a
^3*b^3*c*d^5)*g^3*i^2*x^2)*log((b*e*x + a*e)/(d*x + c)))/(b^3*d^4)
```

Sympy [B] time = 14.5041, size = 1761, normalized size = 4.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**3*d**2*g**3*i**2*x**6/6 + B*a**4*g**3*i**2*(a**2*d**2 - 6*a*b*c*d + 15
*b**2*c**2)*log(x + (B*a**6*c*d**5*g**3*i**2 - 6*B*a**5*b*c**2*d**4*g**3*i*
*2 + B*a**5*d**4*g**3*i**2*(a**2*d**2 - 6*a*b*c*d + 15*b**2*c**2)/b + 35*B*
a**4*b**2*c**3*d**3*g**3*i**2 - B*a**4*c*d**3*g**3*i**2*(a**2*d**2 - 6*a*b*
c*d + 15*b**2*c**2) - 15*B*a**3*b**3*c**4*d**2*g**3*i**2 + 6*B*a**2*b**4*c*
*5*d*g**3*i**2 - B*a*b**5*c**6*g**3*i**2)/(B*a**6*d**6*g**3*i**2 - 6*B*a**5
*b*c*d**5*g**3*i**2 + 15*B*a**4*b**2*c**2*d**4*g**3*i**2 + 20*B*a**3*b**3*c
**3*d**3*g**3*i**2 - 15*B*a**2*b**4*c**4*d**2*g**3*i**2 + 6*B*a*b**5*c**5*d
*g**3*i**2 - B*b**6*c**6*g**3*i**2))/(60*b**3) - B*c**3*g**3*i**2*(20*a**3*
d**3 - 15*a**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3)*log(x + (B*a**6*c*d*
*5*g**3*i**2 - 6*B*a**5*b*c**2*d**4*g**3*i**2 + 35*B*a**4*b**2*c**3*d**3*g*
*3*i**2 - 15*B*a**3*b**3*c**4*d**2*g**3*i**2 + 6*B*a**2*b**4*c**5*d*g**3*i*
*2 - B*a*b**5*c**6*g**3*i**2 - B*a*b**2*c**3*g**3*i**2*(20*a**3*d**3 - 15*a
**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3) + B*b**3*c**4*g**3*i**2*(20*a**
3*d**3 - 15*a**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3)/d)/(B*a**6*d**6*g*
*3*i**2 - 6*B*a**5*b*c*d**5*g**3*i**2 + 15*B*a**4*b**2*c**2*d**4*g**3*i**2
+ 20*B*a**3*b**3*c**3*d**3*g**3*i**2 - 15*B*a**2*b**4*c**4*d**2*g**3*i**2 +
 6*B*a*b**5*c**5*d*g**3*i**2 - B*b**6*c**6*g**3*i**2))/(60*d**4) + x**5*(3*
A*a*b**2*d**2*g**3*i**2/5 + 2*A*b**3*c*d*g**3*i**2/5 + B*a*b**2*d**2*g**3*i
**2/30 - B*b**3*c*d*g**3*i**2/30) + x**4*(3*A*a**2*b*d**2*g**3*i**2/4 + 3*A
*a*b**2*c*d*g**3*i**2/2 + A*b**3*c**2*g**3*i**2/4 + 13*B*a**2*b*d**2*g**3*i
**2/120 - B*a*b**2*c*d*g**3*i**2/20 - 7*B*b**3*c**2*g**3*i**2/120) + (B*a**
```

```
3*c**2*g**3*i**2*x + B*a**3*c*d*g**3*i**2*x**2 + B*a**3*d**2*g**3*i**2*x**3
/3 + 3*B*a**2*b*c**2*g**3*i**2*x**2/2 + 2*B*a**2*b*c*d*g**3*i**2*x**3 + 3*B
*a**2*b*d**2*g**3*i**2*x**4/4 + B*a*b**2*c**2*g**3*i**2*x**3 + 3*B*a*b**2*c
*d*g**3*i**2*x**4/2 + 3*B*a*b**2*d**2*g**3*i**2*x**5/5 + B*b**3*c**2*g**3*i
**2*x**4/4 + 2*B*b**3*c*d*g**3*i**2*x**5/5 + B*b**3*d**2*g**3*i**2*x**6/6)*
log(e*(a + b*x)/(c + d*x)) + x**3*(60*A*a**3*d**3*g**3*i**2 + 360*A*a**2*b*
c*d**2*g**3*i**2 + 180*A*a*b**2*c**2*d*g**3*i**2 + 19*B*a**3*d**3*g**3*i**2
 + 21*B*a**2*b*c*d**2*g**3*i**2 - 39*B*a*b**2*c**2*d*g**3*i**2 - B*b**3*c**
3*g**3*i**2)/(180*d) + x**2*(120*A*a**3*b*c*d**3*g**3*i**2 + 180*A*a**2*b**
2*c**2*d**2*g**3*i**2 + B*a**4*d**4*g**3*i**2 + 34*B*a**3*b*c*d**3*g**3*i**
2 - 30*B*a**2*b**2*c**2*d**2*g**3*i**2 - 6*B*a*b**3*c**3*d*g**3*i**2 + B*b*
*4*c**4*g**3*i**2)/(120*b*d**2) - x*(-60*A*a**3*b**2*c**2*d**3*g**3*i**2 +
B*a**5*d**5*g**3*i**2 - 6*B*a**4*b*c*d**4*g**3*i**2 - 5*B*a**3*b**2*c**2*d*
*3*g**3*i**2 + 15*B*a**2*b**3*c**3*d**2*g**3*i**2 - 6*B*a*b**4*c**4*d*g**3*
i**2 + B*b**5*c**5*g**3*i**2)/(60*b**2*d**3)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="giac")
```

```
[Out] Timed out
```

3.11 $\int (ag+bgx)^2(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=337

$$\frac{b^2g^2i^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^3}+\frac{g^2i^2(c+dx)^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^3}-\frac{bg^2i^2(c+dx)^4(bc-ad)\left(B\log\right.}{2d^3}$$

```
[Out] -(B*(b*c - a*d)^4*g^2*i^2*x)/(30*b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*(c + d
*x)^2)/(60*b*d^3) + (B*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3)/(10*d^3) - (b*B*(
b*c - a*d)*g^2*i^2*(c + d*x)^4)/(20*d^3) - (B*(b*c - a*d)^5*g^2*i^2*Log[(a
+ b*x)/(c + d*x)])/(30*b^3*d^3) + ((b*c - a*d)^2*g^2*i^2*(c + d*x)^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^3) - (b*(b*c - a*d)*g^2*i^2*(c + d*x)^
4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^3) + (b^2*g^2*i^2*(c + d*x)^5*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*d^3) - (B*(b*c - a*d)^5*g^2*i^2*Lo
g[c + d*x])/(30*b^3*d^3)
```

Rubi [A] time = 0.50839, antiderivative size = 296, normalized size of antiderivative = 0.88, number of steps used = 14, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 43}

$$\frac{d^2g^2i^2(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b^3}+\frac{g^2i^2(a+bx)^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3}+\frac{dg^2i^2(a+bx)^4(bc-ad)\left(B\log\right.}{2b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^4*g^2*i^2*x)/(30*b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*(a + b*
x)^2)/(60*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*(a + b*x)^3)/(10*b^3) - (B*d*(b
*c - a*d)*g^2*i^2*(a + b*x)^4)/(20*b^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^
3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^3) + (d*(b*c - a*d)*g^2*i^2*(a
 + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^3) + (d^2*g^2*i^2*(a +
 b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b^3) - (B*(b*c - a*d)^5*g^
2*i^2*Log[c + d*x])/(30*b^3*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (11c+11dx)^2(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{(-bc+ad)^2g^2(11c+11dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}-\frac{2b(bc-$$

$$=\frac{(b^2g^2)\int(11c+11dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{121d^2}-\frac{(2b(bc-ad)$$

$$=\frac{121(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d^3}-\frac{121b(bc-ad)$$

$$=\frac{121(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d^3}-\frac{121b(bc-ad)$$

$$=\frac{121(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d^3}-\frac{121b(bc-ad)$$

$$=-\frac{121B(bc-ad)^4g^2x}{30b^2d^2}-\frac{121B(bc-ad)^3g^2(c+dx)^2}{60bd^3}+\frac{121B(bc-$$

Mathematica [A] time = 0.250358, size = 362, normalized size = 1.07

$$\frac{g^2i^2\left(12d^5(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+30d^4(a+bx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+20d^3(a+bx)^3(bc-ad)^2\left(B\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)]),x]
```

```
[Out] (g^2*i^2*(20*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)]) + 30*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
+ 12*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 10*B*(b*c - a*d
)^3*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x])
- 5*B*(b*c - a*d)^2*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)
^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + B*(b*c - a*d)*(12*
b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(
a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x])))/(60*b^3*d
^3)
```

Maple [B] time = 0.191, size = 6116, normalized size = 18.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.45388, size = 1620, normalized size = 4.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="maxima")
```

```
[Out] 1/5*A*b^2*d^2*g^2*i^2*x^5 + 1/2*A*b^2*c*d*g^2*i^2*x^4 + 1/2*A*a*b*d^2*g^2*i
^2*x^4 + 1/3*A*b^2*c^2*g^2*i^2*x^3 + 4/3*A*a*b*c*d*g^2*i^2*x^3 + 1/3*A*a^2*
d^2*g^2*i^2*x^3 + A*a*b*c^2*g^2*i^2*x^2 + A*a^2*c*d*g^2*i^2*x^2 + (x*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^2
*c^2*g^2*i^2 + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)
/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a*b*c^2*g^2*i^2 + 1/6*
(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^
3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b
^2*d^2))*B*b^2*c^2*g^2*i^2 + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^
2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^2*c*d*
g^2*i^2 + 2/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x +
 a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2))*B*a*b*c*d*g^2*i^2 + 1/12*(6*x^4*log(b*e*x/(d*x + c)
+ a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^
3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3
*d^3)*x)/(b^3*d^3))*B*b^2*c*d*g^2*i^2 + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*
e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d
- a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^2*d^2*g^2*i^2 + 1/
12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6
*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2
*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*b*d^2*g^2*i^2 + 1/60*
(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12
*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a
^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)
/(b^4*d^4))*B*b^2*d^2*g^2*i^2 + A*a^2*c^2*g^2*i^2*x
```

Fricas [A] time = 1.39599, size = 1102, normalized size = 3.27

$$12\,Ab^5d^5g^2i^2x^5 + 3\left((10\,A - B)b^5cd^4 + (10\,A + B)ab^4d^5\right)g^2i^2x^4 + 2\left((10\,A - 3\,B)b^5c^2d^3 + 40\,Aab^4cd^4 + (10\,A + 3\,B)a^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^2*i^2*x^5 + 3*((10*A - B)*b^5*c*d^4 + (10*A + B)*a*b^4
*d^5)*g^2*i^2*x^4 + 2*((10*A - 3*B)*b^5*c^2*d^3 + 40*A*a*b^4*c*d^4 + (10*A
+ 3*B)*a^2*b^3*d^5)*g^2*i^2*x^3 - (B*b^5*c^3*d^2 - 15*(4*A - B)*a*b^4*c^2*d
^3 - 15*(4*A + B)*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*g^2*i^2*x^2 + 2*(B*b^5*c^4
*d - 5*B*a*b^4*c^3*d^2 + 30*A*a^2*b^3*c^2*d^3 + 5*B*a^3*b^2*c*d^4 - B*a^4*b
*d^5)*g^2*i^2*x + 2*(10*B*a^3*b^2*c^2*d^3 - 5*B*a^4*b*c*d^4 + B*a^5*d^5)*g^
2*i^2*log(b*x + a) - 2*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)
```

```
*g^2*i^2*log(d*x + c) + 2*(6*B*b^5*d^5*g^2*i^2*x^5 + 30*B*a^2*b^3*c^2*d^3*g
^2*i^2*x + 15*(B*b^5*c*d^4 + B*a*b^4*d^5)*g^2*i^2*x^4 + 10*(B*b^5*c^2*d^3 +
 4*B*a*b^4*c*d^4 + B*a^2*b^3*d^5)*g^2*i^2*x^3 + 30*(B*a*b^4*c^2*d^3 + B*a^2
*b^3*c*d^4)*g^2*i^2*x^2)*log((b*e*x + a*e)/(d*x + c)))/(b^3*d^3)
```

Sympy [B] time = 9.6747, size = 1292, normalized size = 3.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**2*d**2*g**2*i**2*x**5/5 + B*a**3*g**2*i**2*(a**2*d**2 - 5*a*b*c*d + 10
*b**2*c**2)*log(x + (B*a**5*c*d**4*g**2*i**2 - 5*B*a**4*b*c**2*d**3*g**2*i*
*2 + B*a**4*d**3*g**2*i**2*(a**2*d**2 - 5*a*b*c*d + 10*b**2*c**2)/b + 20*B*
a**3*b**2*c**3*d**2*g**2*i**2 - B*a**3*c*d**2*g**2*i**2*(a**2*d**2 - 5*a*b*
c*d + 10*b**2*c**2) - 5*B*a**2*b**3*c**4*d*g**2*i**2 + B*a*b**4*c**5*g**2*i
**2)/(B*a**5*d**5*g**2*i**2 - 5*B*a**4*b*c*d**4*g**2*i**2 + 10*B*a**3*b**2*
c**2*d**3*g**2*i**2 + 10*B*a**2*b**3*c**3*d**2*g**2*i**2 - 5*B*a*b**4*c**4*
d*g**2*i**2 + B*b**5*c**5*g**2*i**2))/(30*b**3) - B*c**3*g**2*i**2*(10*a**2
*d**2 - 5*a*b*c*d + b**2*c**2)*log(x + (B*a**5*c*d**4*g**2*i**2 - 5*B*a**4*
b*c**2*d**3*g**2*i**2 + 20*B*a**3*b**2*c**3*d**2*g**2*i**2 - 5*B*a**2*b**3*
c**4*d*g**2*i**2 + B*a*b**4*c**5*g**2*i**2 - B*a*b**2*c**3*g**2*i**2*(10*a*
*2*d**2 - 5*a*b*c*d + b**2*c**2) + B*b**3*c**4*g**2*i**2*(10*a**2*d**2 - 5*
a*b*c*d + b**2*c**2)/d)/(B*a**5*d**5*g**2*i**2 - 5*B*a**4*b*c*d**4*g**2*i**
2 + 10*B*a**3*b**2*c**2*d**3*g**2*i**2 + 10*B*a**2*b**3*c**3*d**2*g**2*i**2
 - 5*B*a*b**4*c**4*d*g**2*i**2 + B*b**5*c**5*g**2*i**2))/(30*d**3) + x**4*(
A*a*b*d**2*g**2*i**2/2 + A*b**2*c*d*g**2*i**2/2 + B*a*b*d**2*g**2*i**2/20 -
 B*b**2*c*d*g**2*i**2/20) + x**3*(A*a**2*d**2*g**2*i**2/3 + 4*A*a*b*c*d*g**
2*i**2/3 + A*b**2*c**2*g**2*i**2/3 + B*a**2*d**2*g**2*i**2/10 - B*b**2*c**2
*g**2*i**2/10) + (B*a**2*c**2*g**2*i**2*x + B*a**2*c*d*g**2*i**2*x**2 + B*a
**2*d**2*g**2*i**2*x**3/3 + B*a*b*c**2*g**2*i**2*x**2 + 4*B*a*b*c*d*g**2*i*
*2*x**3/3 + B*a*b*d**2*g**2*i**2*x**4/2 + B*b**2*c**2*g**2*i**2*x**3/3 + B*
b**2*c*d*g**2*i**2*x**4/2 + B*b**2*d**2*g**2*i**2*x**5/5)*log(e*(a + b*x)/(
c + d*x)) + x**2*(60*A*a**2*b*c*d**2*g**2*i**2 + 60*A*a*b**2*c**2*d*g**2*i*
*2 + B*a**3*d**3*g**2*i**2 + 15*B*a**2*b*c*d**2*g**2*i**2 - 15*B*a*b**2*c**
2*d*g**2*i**2 - B*b**3*c**3*g**2*i**2)/(60*b*d) - x*(-30*A*a**2*b**2*c**2*d
**2*g**2*i**2 + B*a**4*d**4*g**2*i**2 - 5*B*a**3*b*c*d**3*g**2*i**2 + 5*B*a
*b**3*c**3*d*g**2*i**2 - B*b**4*c**4*g**2*i**2)/(30*b**2*d**2)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="giac")
```

```
[Out] Timed out
```

3.12 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=239

$$-\frac{gi^2(c+dx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^2}+\frac{bgi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2}+\frac{Bgi^2(bc-ad)^4\log\left(\frac{a+bx}{c+dx}\right)}{12b^3d^2}+\frac{Bgi^2}{}$$

```
[Out] (B*(b*c - a*d)^3*g*i^2*x)/(12*b^2*d) + (B*(b*c - a*d)^2*g*i^2*(c + d*x)^2)/
(24*b*d^2) - (B*(b*c - a*d)*g*i^2*(c + d*x)^3)/(12*d^2) + (B*(b*c - a*d)^4*
g*i^2*Log[(a + b*x)/(c + d*x)])/(12*b^3*d^2) - ((b*c - a*d)*g*i^2*(c + d*x)
^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^2) + (b*g*i^2*(c + d*x)^4*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(4*d^2) + (B*(b*c - a*d)^4*g*i^2*Log[c +
 d*x])/(12*b^3*d^2)
```

Rubi [A] time = 0.341305, antiderivative size = 200, normalized size of antiderivative = 0.84, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 43}

$$-\frac{gi^2(c+dx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d^2}+\frac{bgi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2}+\frac{Bgi^2(bc-ad)^4\log(a+bx)}{12b^3d^2}+\frac{Bgi}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^3*g*i^2*x)/(12*b^2*d) + (B*(b*c - a*d)^2*g*i^2*(c + d*x)^2)/
(24*b*d^2) - (B*(b*c - a*d)*g*i^2*(c + d*x)^3)/(12*d^2) + (B*(b*c - a*d)^4*
g*i^2*Log[a + b*x])/(12*b^3*d^2) - ((b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(3*d^2) + (b*g*i^2*(c + d*x)^4*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(4*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (12c+12dx)^2(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{(-bc+ad)g(12c+12dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d}+\frac{bg(12c+\cdots}{}\right.$$

$$=\frac{(bg)\int(12c+12dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{12d}+\frac{((-bc+ad)g)\int\cdots}{}$$

$$=-\frac{48(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}+\frac{36bg(c+dx)^4\left(\cdots\right.}{}$$

$$=-\frac{48(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}+\frac{36bg(c+dx)^4\left(\cdots\right.}{}$$

$$=-\frac{48(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}+\frac{36bg(c+dx)^4\left(\cdots\right.}{}$$

$$=\frac{12B(bc-ad)^3gx}{b^2d}+\frac{6B(bc-ad)^2g(c+dx)^2}{bd^2}-\frac{12B(bc-ad)g(c+\cdots}{d^2}$$

Mathematica [A] time = 0.182512, size = 216, normalized size = 0.9

$$\frac{gi^2\left(6b(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-8(c+dx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{4B(bc-ad)^2\left(2bdx(bc-ad)+2(bc-ad)^2\log(a+bx)+b^{\cdots}\right.}{b^3}\cdots}{24d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
),x]
```

```
[Out] (g*i^2*((4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c
- a*d)^2*Log[a + b*x]))/b^3 - (B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*b^2
*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]
))/b^3 - 8*(b*c - a*d)*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6
*b*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(24*d^2)
```

Maple [B] time = 0.173, size = 3439, normalized size = 14.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] 1/24*e^2/d^2*B*g*i^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4-1/12*e*d^2*B*g
*i^2/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4+1/4*e^4*d^2*A*g*i^2*b/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^4*a^4-1/6*e^2*d*B*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2
```

```
*a^3*c+1/3*e^3*d^2*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e
/(d*x+c)*b*c)^3*a^4+1/3*d*B*g*i^2/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*
e)*a^3*c+1/24*e^2*d^2*B*g*i^2/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4+1/12*e^
3/d^2*B*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^4*c^4+1/3*e^3/d^2*A*g*i^2/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^4*c^4+1/4*e^4/d^2*A*g*i^2*b^5/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)^4*c^4-1/12*e/d^2*B*g*i^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)*c^4+2*e^3*A*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*b^2*c^2+3/2*e^4*A*g
*i^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*c^2+1/2*e^3*B*g*i^2/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^3*a^2*b^2*c^2+1/4*e^2*B*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)^2*a^2*c^2*b-1/4*e^4*d^6*B*g*i^2/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^8/(d*x+c)^4+14*e^4*d^3*B*g*i^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^3/(d*x+c)^4*a^5-1/2*B
*g*i^2/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c^2+1/12*e^3*d^2*B*g*i
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+1/3/d*B*g*i^2*ln(d*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))-b*e)*c^3*a-1/12*d^2*B*g*i^2/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-b*e)*a^4-1/12/d^2*B*g*i^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^4*
b-1/2*e*B*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c^2+1/3*e^3*d^2*A*g*i^2/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+35/3*e^3*d*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*c^4/(d*x+c)^3*b+14*e^4*d*B*g
*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^5/(d
*x+c)^4*a^3*b^2+7/3*e^3/d*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3*b^3*a+2*e^4*d^5*B*g*i^2/b^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^7/(d*x+c)^4*c+2*e^4
/d*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*
c^7/(d*x+c)^4*b^4*a-35/2*e^4*d^2*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^4/(d*x+c)^4*a^4*b-7*e^4*d^4*B*g*i^2/b*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^6/(d*x+c)^4*c^
2-7/3*e^3*d^4*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^3*a^6*c/(d*x+c)^3+7*e^3*d^3*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5*c^2/(d*x+c)^3+1/3*e*d*B*g*i^2/b
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3*c+1/3*e/d*B*g*i^2*b/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)*c^3*a-e^4/d*A*g*i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^3*a-1/3
*e^3/d^2*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)^3*c^7/(d*x+c)^3*b^4-1/4*e^4/d^2*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^8/(d*x+c)^4*b^5-7*e^3*B*g*i^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^5/(d*x+c)^3*a^2*b^2
-7*e^4*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^4*c^6/(d*x+c)^4*a^2*b^3-e^4*d*B*g*i^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c-e^4/d*B*g*i^2*b^4*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^3*a-4/3*e^3*d*B*g*i^2*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*b*c+1/3*e^3*
d^5*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^3*a^7/(d*x+c)^3-35/3*e^3*d^2*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*
e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4*c^3/(d*x+c)^3-4/3*e^3/d*B*g*i^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a*c^3*b^3-1/3*e^3*d*B
*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*b*c-4/3*e^3*d*A*g*i^2/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^3*a^3*b*c-1/3*e^3/d*B*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^3*b^3*c^3*a-1/6*e^2/d*B*g*i^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3*a-
4/3*e^3/d*A*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^3*c^3*a-e^4*d*A*g*i^2*b
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c+3/2*e^4*B*g*i^2*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^3*c^2+2*e^3*B*g*i^2*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c^2*b^2+1/
4*e^4/d^2*B*g*i^2*b^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^4*c^4+1/3*e^3/d^2*B*g*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^4/(d*e
/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4+1/4*e^4*d^2*B*g*i^2*b*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4
```

Maxima [B] time = 1.53032, size = 906, normalized size = 3.79

$$\frac{1}{4}\,Abd^2gi^2x^4 + \frac{2}{3}\,Abcdgi^2x^3 + \frac{1}{3}\,Aad^2gi^2x^3 + \frac{1}{2}\,Abc^2gi^2x^2 + Aacdgi^2x^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="maxima")
```

```
[Out] 1/4*A*b*d^2*g*i^2*x^4 + 2/3*A*b*c*d*g*i^2*x^3 + 1/3*A*a*d^2*g*i^2*x^3 + 1/2
*A*b*c^2*g*i^2*x^2 + A*a*c*d*g*i^2*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a*c^2*g*i^2 + 1/2*(x^2*log(b
*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d
^2 - (b*c - a*d)*x/(b*d))*B*b*c^2*g*i^2 + (x^2*log(b*e*x/(d*x + c) + a*e/(d
*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d
))*B*a*c*d*g*i^2 + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*
log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b
^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b*c*d*g*i^2 + 1/6*(2*x^3*log(b*e*x/(d*x +
 c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*d^2*g*i^2
+ 1/24*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4
 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d -
 a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b*d^2*g*i^2 + A*a*c
^2*g*i^2*x
```

Fricas [A] time = 1.54713, size = 774, normalized size = 3.24

$$\frac{6\,Ab^4d^4gi^2x^4 + 2\left((8\,A-B)b^4cd^3 + (4\,A+B)ab^3d^4\right)gi^2x^3 + \left((12\,A-5\,B)b^4c^2d^2 + 4\,(6\,A+B)ab^3cd^3 + Ba^2b^2d^4\right)gi^2x^2 - 2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g*i^2*x^4 + 2*((8*A - B)*b^4*c*d^3 + (4*A + B)*a*b^3*d^4)
*g*i^2*x^3 + ((12*A - 5*B)*b^4*c^2*d^2 + 4*(6*A + B)*a*b^3*c*d^3 + B*a^2*b^
2*d^4)*g*i^2*x^2 - 2*(B*b^4*c^3*d - 2*(6*A - B)*a*b^3*c^2*d^2 - 4*B*a^2*b^2
*c*d^3 + B*a^3*b*d^4)*g*i^2*x + 2*(6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 +
B*a^4*d^4)*g*i^2*log(b*x + a) + 2*(B*b^4*c^4 - 4*B*a*b^3*c^3*d)*g*i^2*log(d
*x + c) + 2*(3*B*b^4*d^4*g*i^2*x^4 + 12*B*a*b^3*c^2*d^2*g*i^2*x + 4*(2*B*b^
4*c*d^3 + B*a*b^3*d^4)*g*i^2*x^3 + 6*(B*b^4*c^2*d^2 + 2*B*a*b^3*c*d^3)*g*i^
2*x^2)*log((b*e*x + a*e)/(d*x + c)))/(b^3*d^2)
```

Sympy [B] time = 6.60334, size = 870, normalized size = 3.64

$$\frac{Abd^2gi^2x^4}{4} + \frac{Ba^2gi^2\left(a^2d^2-4abcd+6b^2c^2\right)\log\left(x + \frac{Ba^4cd^3gi^2-4Ba^3bc^2d^2gi^2+\frac{Ba^3d^2gi^2\left(a^2d^2-4abcd+6b^2c^2\right)}{b}+10Ba^2b^2c^3dgi^2-Ba^2cdgi^2\left(a^2d^2-4a\right.}{Ba^4d^4gi^2-4Ba^3bcd^3gi^2+6Ba^2b^2c^2d^2gi^2+4Bab^3c^3dgi^2-Bb^4c^4gi^2}\right.}{12b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b*d**2*g*i**2*x**4/4 + B*a**2*g*i**2*(a**2*d**2 - 4*a*b*c*d + 6*b**2*c**2
)*log(x + (B*a**4*c*d**3*g*i**2 - 4*B*a**3*b*c**2*d**2*g*i**2 + B*a**3*d**2
*g*i**2*(a**2*d**2 - 4*a*b*c*d + 6*b**2*c**2)/b + 10*B*a**2*b**2*c**3*d*g*i
**2 - B*a**2*c*d*g*i**2*(a**2*d**2 - 4*a*b*c*d + 6*b**2*c**2) - B*a*b**3*c*
*4*g*i**2)/(B*a**4*d**4*g*i**2 - 4*B*a**3*b*c*d**3*g*i**2 + 6*B*a**2*b**2*c
**2*d**2*g*i**2 + 4*B*a*b**3*c**3*d*g*i**2 - B*b**4*c**4*g*i**2))/(12*b**3)
 - B*c**3*g*i**2*(4*a*d - b*c)*log(x + (B*a**4*c*d**3*g*i**2 - 4*B*a**3*b*c
**2*d**2*g*i**2 + 10*B*a**2*b**2*c**3*d*g*i**2 - B*a*b**3*c**4*g*i**2 - B*a
*b**2*c**3*g*i**2*(4*a*d - b*c) + B*b**3*c**4*g*i**2*(4*a*d - b*c)/d)/(B*a*
*4*d**4*g*i**2 - 4*B*a**3*b*c*d**3*g*i**2 + 6*B*a**2*b**2*c**2*d**2*g*i**2
+ 4*B*a*b**3*c**3*d*g*i**2 - B*b**4*c**4*g*i**2))/(12*d**2) + x**3*(A*a*d**
2*g*i**2/3 + 2*A*b*c*d*g*i**2/3 + B*a*d**2*g*i**2/12 - B*b*c*d*g*i**2/12) +
 (B*a*c**2*g*i**2*x + B*a*c*d*g*i**2*x**2 + B*a*d**2*g*i**2*x**3/3 + B*b*c*
*2*g*i**2*x**2/2 + 2*B*b*c*d*g*i**2*x**3/3 + B*b*d**2*g*i**2*x**4/4)*log(e*
(a + b*x)/(c + d*x)) + x**2*(24*A*a*b*c*d*g*i**2 + 12*A*b**2*c**2*g*i**2 +
B*a**2*d**2*g*i**2 + 4*B*a*b*c*d*g*i**2 - 5*B*b**2*c**2*g*i**2)/(24*b) - x*
(-12*A*a*b**2*c**2*d*g*i**2 + B*a**3*d**3*g*i**2 - 4*B*a**2*b*c*d**2*g*i**2
 + 2*B*a*b**2*c**2*d*g*i**2 + B*b**3*c**3*g*i**2)/(12*b**2*d)
```

Giac [A] time = 14.4937, size = 441, normalized size = 1.85

$$-\frac{1}{4}\left(Abd^2g + Bbd^2g\right)x^4 - \frac{1}{12}\left(8\,Abcdg + 7\,Bbcdg + 4\,Aad^2g + 5\,Bad^2g\right)x^3 - \frac{\left(12\,Ab^2c^2g + 7\,Bb^2c^2g + 24\,Aabcdg + 28\right.}{24\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="giac")
```

```
[Out] -1/4*(A*b*d^2*g + B*b*d^2*g)*x^4 - 1/12*(8*A*b*c*d*g + 7*B*b*c*d*g + 4*A*a*
d^2*g + 5*B*a*d^2*g)*x^3 - 1/24*(12*A*b^2*c^2*g + 7*B*b^2*c^2*g + 24*A*a*b*
c*d*g + 28*B*a*b*c*d*g + B*a^2*d^2*g)*x^2/b - 1/12*(3*B*b*d^2*g*x^4 + 12*B*
a*c^2*g*x + 4*(2*B*b*c*d*g + B*a*d^2*g)*x^3 + 6*(B*b*c^2*g + 2*B*a*c*d*g)*x
^2)*log((b*x + a)/(d*x + c)) - 1/12*(B*b*c^4*g - 4*B*a*c^3*d*g)*log(-d*x -
c)/d^2 + 1/12*(B*b^3*c^3*g - 12*A*a*b^2*c^2*d*g - 10*B*a*b^2*c^2*d*g - 4*B*
a^2*b*c*d^2*g + B*a^3*d^3*g)*x/(b^2*d) - 1/12*(6*B*a^2*b^2*c^2*g - 4*B*a^3*
b*c*d*g + B*a^4*d^2*g)*log(b*x + a)/b^3
```

3.13 $\int (ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=118

$$\frac{i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d}-\frac{Bi^2x(bc-ad)^2}{3b^2}-\frac{Bi^2(bc-ad)^3\log(a+bx)}{3b^3d}-\frac{Bi^2(c+dx)^2(bc-ad)}{6bd}$$

```
[Out] -(B*(b*c - a*d)^2*i^2*x)/(3*b^2) - (B*(b*c - a*d)*i^2*(c + d*x)^2)/(6*b*d)
- (B*(b*c - a*d)^3*i^2*Log[a + b*x])/(3*b^3*d) + (i^2*(c + d*x)^3*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(3*d)
```

Rubi [A] time = 0.0668842, antiderivative size = 118, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3d}-\frac{Bi^2x(bc-ad)^2}{3b^2}-\frac{Bi^2(bc-ad)^3\log(a+bx)}{3b^3d}-\frac{Bi^2(c+dx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2*x)/(3*b^2) - (B*(b*c - a*d)*i^2*(c + d*x)^2)/(6*b*d)
- (B*(b*c - a*d)^3*i^2*Log[a + b*x])/(3*b^3*d) + (i^2*(c + d*x)^3*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(3*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (13c+13dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{169(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d} - \frac{B\int \frac{2197(bc-ad)(c+dx)^2}{a+bx}dx}{39d}$$
$$= \frac{169(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d} - \frac{(169B(bc-ad))\int \frac{(c+dx)^2}{a+bx}dx}{3d}$$
$$= \frac{169(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3d} - \frac{(169B(bc-ad))\int \left(\frac{d(bc-ad)}{b^2}+\frac{(bc-}{b^2(a-}\right.}{3d}$$
$$= -\frac{169B(bc-ad)^2x}{3b^2} - \frac{169B(bc-ad)(c+dx)^2}{6bd} - \frac{169B(bc-ad)^3\log(a+}{3b^3d}$$

Mathematica [A] time = 0.0398882, size = 97, normalized size = 0.82

$$\frac{i^2\left((c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B(bc-ad)\left(2bdx(bc-ad)+2(bc-ad)^2\log(a+bx)+b^2(c+dx)^2\right)}{2b^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (i^2*(-(B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d
)^2*Log[a + b*x]))/(2*b^3) + (c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
])))/(3*d)
```

Maple [B] time = 0.155, size = 1522, normalized size = 12.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] 1/3*e^3*d^2*A*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3-1/3*d^2*B*i^2/b^3*ln(
d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3-B*i^2/b*ln(d*(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-b*e)*c^2*a-e*B*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c^2+1/3*e/d*B*i
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3*b+1/6*e^2*d^2*B*i^2/b/(d*e/(d*x+c)*a-e
/(d*x+c)*b*c)^2*a^3-1/6*e^2/d*B*i^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3
+1/2*e^2*B*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^2*b+e^3*A*i^2/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^3*a*b^2*c^2+e^3*B*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^2*a-1/3*e*d^2*B*i^2/b^2/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)*a^3-1/3*e^3/d*A*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^3*c^3
-1/2*e^2*d*B*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+1/3*e^3*d^2*B*i^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3+d*B*i^2/b
^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c+e*d*B*i^2/b/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)*a^2*c-e^3*d*A*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*b*c-1
/3*e^3/d*B*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^3*c^3+1/3/d*B*i^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^3+5*e^3*d
^3*B*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*
a^4/(d*x+c)^3*c^2-20/3*e^3*d^2*B*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^3*a^3/(d*x+c)^3*c^3+1/3*e^3/d*B*i^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3-e^3*d*B*
i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*b*c
```

```
+1/3*e^3*d^5*B*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^3/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^3*a^6/(d*x+c)^3-2*e^3*B*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a*c^5/(d*x+c)^3+5*e^3*d*B*i^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2/(d*x+c)^3*c^4*b-2*e^3
*d^4*B*i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^3*a^5/(d*x+c)^3*c
```

Maxima [B] time = 1.38073, size = 378, normalized size = 3.2

$$\frac{1}{3}Ad^2i^2x^3 + Acdi^2x^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Bc^2i^2 + \left(x^2\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) - \cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/3*A*d^2*i^2*x^3 + A*c*d*i^2*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*c^2*i^2 + (x^2*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a
*d)*x/(b*d))*B*c*d*i^2 + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
- 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*d^2*i^2 + A*c^2*i^2*x
```

Fricas [B] time = 1.35517, size = 467, normalized size = 3.96

$$\frac{2\,Ab^3d^3i^2x^3 - 2\,Bb^3c^3i^2\log(dx+c) + \left((6\,A-B)b^3cd^2 + Bab^2d^3\right)i^2x^2 + 2\left((3\,A-2\,B)b^3c^2d + 3\,Bab^2cd^2 - Ba^2bd^3\right)i^2x + \cdots}{6\,b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*i^2*x^3 - 2*B*b^3*c^3*i^2*log(d*x + c) + ((6*A - B)*b^3*c*
d^2 + B*a*b^2*d^3)*i^2*x^2 + 2*((3*A - 2*B)*b^3*c^2*d + 3*B*a*b^2*c*d^2 - B
*a^2*b*d^3)*i^2*x + 2*(3*B*a*b^2*c^2*d - 3*B*a^2*b*c*d^2 + B*a^3*d^3)*i^2*l
og(b*x + a) + 2*(B*b^3*d^3*i^2*x^3 + 3*B*b^3*c*d^2*i^2*x^2 + 3*B*b^3*c^2*d*
i^2*x)*log((b*e*x + a*e)/(d*x + c)))/(b^3*d)
```

Sympy [B] time = 3.70134, size = 503, normalized size = 4.26

$$\frac{Ad^2i^2x^3}{3} + \frac{Bai^2\left(a^2d^2 - 3abcd + 3b^2c^2\right)\log\left(x + \frac{Ba^3cd^2i^2 - 3Ba^2bc^2di^2 + \frac{Ba^2di^2\left(a^2d^2-3abcd+3b^2c^2\right)}{b} + 4Bab^2c^3i^2 - Baci^2\left(a^2d^2-3abcd+3b^2c^2\right)}{Ba^3d^3i^2 - 3Ba^2bcd^2i^2 + 3Bab^2c^2di^2 + Bb^3c^3i^2}\right)}{3b^3} - \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*d**2*i**2*x**3/3 + B*a*i**2*(a**2*d**2 - 3*a*b*c*d + 3*b**2*c**2)*log(x +
 (B*a**3*c*d**2*i**2 - 3*B*a**2*b*c**2*d*i**2 + B*a**2*d*i**2*(a**2*d**2 -
```

```
3*a*b*c*d + 3*b**2*c**2)/b + 4*B*a*b**2*c**3*i**2 - B*a*c*i**2*(a**2*d**2 -
 3*a*b*c*d + 3*b**2*c**2))/(B*a**3*d**3*i**2 - 3*B*a**2*b*c*d**2*i**2 + 3*B
*a*b**2*c**2*d*i**2 + B*b**3*c**3*i**2))/(3*b**3) - B*c**3*i**2*log(x + (B*
a**3*c*d**2*i**2 - 3*B*a**2*b*c**2*d*i**2 + 3*B*a*b**2*c**3*i**2 + B*b**3*c
**4*i**2/d)/(B*a**3*d**3*i**2 - 3*B*a**2*b*c*d**2*i**2 + 3*B*a*b**2*c**2*d*
i**2 + B*b**3*c**3*i**2))/(3*d) + (B*c**2*i**2*x + B*c*d*i**2*x**2 + B*d**2
*i**2*x**3/3)*log(e*(a + b*x)/(c + d*x)) + x**2*(6*A*b*c*d*i**2 + B*a*d**2*
i**2 - B*b*c*d*i**2)/(6*b) - x*(-3*A*b**2*c**2*i**2 + B*a**2*d**2*i**2 - 3*
B*a*b*c*d*i**2 + 2*B*b**2*c**2*i**2)/(3*b**2)
```

Giac [A] time = 2.04041, size = 240, normalized size = 2.03

$$-\frac{1}{3}\left(Ad^2+Bd^2\right)x^3+\frac{Bc^3\log\left(dx+c\right)}{3\,d}-\frac{\left(6\,Abcd+5\,Bbcd+Bad^2\right)x^2}{6\,b}-\frac{1}{3}\left(Bd^2x^3+3\,Bcdx^2+3\,Bc^2x\right)\log\left(\frac{bx+a}{dx+c}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] -1/3*(A*d^2 + B*d^2)*x^3 + 1/3*B*c^3*log(d*x + c)/d - 1/6*(6*A*b*c*d + 5*B*
b*c*d + B*a*d^2)*x^2/b - 1/3*(B*d^2*x^3 + 3*B*c*d*x^2 + 3*B*c^2*x)*log((b*x
 + a)/(d*x + c)) - 1/3*(3*A*b^2*c^2 + B*b^2*c^2 + 3*B*a*b*c*d - B*a^2*d^2)*
x/b^2 - 1/3*(3*B*a*b^2*c^2 - 3*B*a^2*b*c*d + B*a^3*d^2)*log(b*x + a)/b^3
```

3.14 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=276

$$\frac{Bi^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{di^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}-\frac{i^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a\cdot}{c+}\right.\right.}{b^3g}$$

```
[Out] -(B*d*(b*c - a*d)*i^2*x)/(2*b^2*g) - (B*(b*c - a*d)^2*i^2*Log[(a + b*x)/(c
+ d*x)])/(2*b^3*g) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(2*b*g) - (3*B*(b*c - a*d)^2*i^2*Log[c + d*x])/(2*b^3*g) - ((b*c - a*d)^
2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*
x))])/(b^3*g) + (B*(b*c - a*d)^2*i^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))
])/(b^3*g)
```

Rubi [A] time = 0.490415, antiderivative size = 354, normalized size of antiderivative = 1.28, number of steps used = 19, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^2(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^3g}+\frac{i^2(bc-ad)^2\log(ag+bgx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}+\frac{Adi^2x(bc-ad)}{b^2g}+\frac{i^2(c+dx)^2\left(B\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x),x]
```

```
[Out] (A*d*(b*c - a*d)*i^2*x)/(b^2*g) - (B*d*(b*c - a*d)*i^2*x)/(2*b^2*g) - (B*(b
*c - a*d)^2*i^2*Log[a + b*x])/(2*b^3*g) - (B*(b*c - a*d)^2*i^2*Log[g*(a + b
*x)]^2)/(2*b^3*g) + (B*d*(b*c - a*d)*i^2*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)])/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b
*g) - (B*(b*c - a*d)^2*i^2*Log[c + d*x])/(b^3*g) + ((b*c - a*d)^2*i^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[a*g + b*g*x])/(b^3*g) + (B*(b*c - a*d)^
2*i^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b^3*g) + (B*(b*c -
a*d)^2*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(14c+14dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx = \int \left(\frac{196d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g} + \frac{14d(14c+14dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{bg}\right.$$

$$= \frac{\left(196(bc-ad)^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}\,dx}{b^2} + \frac{(14d)\int(14c+14dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{bg}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} + \frac{98(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg} + \frac{196(bc-ad)^2\left(A+\right.}{}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} + \frac{196Bd(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + \frac{98(c+dx)^2\left(A+\right.}{bg}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} + \frac{196Bd(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + \frac{98(c+dx)^2\left(A+\right.}{bg}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+bx)}{b^3g} + \frac{196Bd(bc}{}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+bx)}{b^3g} + \frac{196Bd(bc}{}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+bx)}{b^3g} + \frac{196Bd(bc}{}$$

$$= \frac{196Ad(bc-ad)x}{b^2g} - \frac{98Bd(bc-ad)x}{b^2g} - \frac{98B(bc-ad)^2\log(a+bx)}{b^3g} - \frac{98B(bc-}{}$$

Mathematica [A] time = 0.182786, size = 252, normalized size = 0.91

$$\frac{i^2\left(B(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)-\log(g(a+bx))\left(\log(g(a+bx))-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)+b^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x),x]
```

```
[Out] (i^2*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*(b*d*x + (b*c - a*d)*Log[a + b*
x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*(c + d
*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c - a*d)^2*Log[g*(a + b*x
```

```
)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a*d)^2*Log[c + d*x] +
B*(b*c - a*d)^2*(-(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*Log[(b*(c + d*x))
/(b*c - a*d)])) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(2*b^3*g)
```

Maple [B] time = 0.176, size = 2538, normalized size = 9.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] -A*i^2/g/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2+A*i^2/g/b*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*c^2+1/2*B*i^2/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c
^2-B*i^2/g/b*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c^2+3/2*B*i^
2/g/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2-e*A*i^2/g/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)*c^2+1/2*e*B*i^2/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2-e*B*i^2/
g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+1/2*e^2
*A*i^2/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2*b+2*e^2*d*B*i^2/g*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3/(d*x+c)^2*a-e*d^3*B
*i^2/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^
3/(d*x+c)+2*e*d*B*i^2/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)*a*c-d*B*i^2/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a*c+2*d*B*
i^2/g/b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*c-3*d*B*i^2/g
/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*c+2*d*A*i^2/g/b^2*ln(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c*a-2*d*A*i^2/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*a*c+1/2*e^2*B*i^2/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e
/(d*x+c)*b*c)^2*c^2*b-d^2*B*i^2/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(
d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2+1/2*e^2*d^2*A*i^2/g/b/(d*e/(d
*x+c)*a-e/(d*x+c)*b*c)^2*a^2-e*d^2*A*i^2/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)*a^2+1/2*e*d^2*B*i^2/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-e^2*d*A*i^2/g
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c+e*B*i^2/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3/(d*x+c)-B*i^2/g/b*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c^2-d^2*A*i^2/g
/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2+d^2*A*i^2/g/b^3*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*a^2+1/2*d^2*B*i^2/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))^2*a^2-d^2*B*i^2/g/b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*
a^2+3/2*d^2*B*i^2/g/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2+3*e*d^2
*B*i^2/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*
a^2/(d*x+c)*c-3*e*d*B*i^2/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)*c^2/(d*x+c)*a+2*e^2*d^3*B*i^2/g/b^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c-3*e^2*d^2*B*i^2/g
/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x
+c)^2*c^2-1/2*e^2*d^4*B*i^2/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2-e*d*B*i^2/g/b/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)*c*a+2*e*d*A*i^2/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c+2*d*B*i^2/g/b^2
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/
b/e)*a*c-e*d^2*B*i^2/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e
/(d*x+c)*b*c)*a^2-1/2*e^2*B*i^2/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2*b+1/2*e^2*d^2*B*i^2/g/b*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2-e^2*d*B*i^2/g*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c*a
```

Maxima [A] time = 1.61365, size = 699, normalized size = 2.53

$$2\,Acdi^2\left(\frac{x}{bg}-\frac{a\log\left(bx+a\right)}{b^2g}\right)+\frac{1}{2}\,Ad^2i^2\left(\frac{2\,a^2\log\left(bx+a\right)}{b^3g}+\frac{bx^2-2\,ax}{b^2g}\right)+\frac{Ac^2i^2\log\left(bgx+ag\right)}{bg}-\frac{\left(3\,bc^2i^2-2\,acdi^2\right)B\log}{2\,b^2g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorit
hm="maxima")
```

```
[Out] 2*A*c*d*i^2*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/2*A*d^2*i^2*(2*a^2*log(b
*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A*c^2*i^2*log(b*g*x + a*g)/(b*
g) - 1/2*(3*b*c^2*i^2 - 2*a*c*d*i^2)*B*log(d*x + c)/(b^2*g) + (b^2*c^2*i^2
- 2*a*b*c*d*i^2 + a^2*d^2*i^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d)
+ 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^3*g) + 1/2*(B*b^2*d^2*i^2*x^
2*log(e) + (b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B*log(b*x + a)^2 + (
(4*i^2*log(e) - i^2)*b^2*c*d - (2*i^2*log(e) - i^2)*a*b*d^2)*B*x + (B*b^2*d
^2*i^2*x^2 + 2*(2*b^2*c*d*i^2 - a*b*d^2*i^2)*B*x + (2*b^2*c^2*i^2*log(e) -
4*(i^2*log(e) - i^2)*a*b*c*d + (2*i^2*log(e) - 3*i^2)*a^2*d^2)*B)*log(b*x +
 a) - (B*b^2*d^2*i^2*x^2 + 2*(2*b^2*c*d*i^2 - a*b*d^2*i^2)*B*x + 2*(b^2*c^2
*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B*log(b*x + a))*log(d*x + c))/(b^3*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{Ad^2i^2x^2+2\,Acdi^2x+Ac^2i^2+\left(Bd^2i^2x^2+2\,Bcdi^2x+Bc^2i^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorit
hm="fricas")
```

```
[Out] integral((A*d^2*i^2*x^2 + 2*A*c*d*i^2*x + A*c^2*i^2 + (B*d^2*i^2*x^2 + 2*B*
c*d*i^2*x + B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(dix+ci)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorit
hm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g),
 x)
```

3.15 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=247

$$\frac{2Bdi^2(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2}+\frac{d^2i^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2}-\frac{i^2(c+dx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2(a+bx)}-\frac{2d}{}$$

```
[Out] -((B*(b*c - a*d)*i^2*(c + d*x))/(b^2*g^2*(a + b*x))) + (d^2*i^2*(a + b*x)*(
A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2) - ((b*c - a*d)*i^2*(c + d*x)
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g^2*(a + b*x)) - (B*d*(b*c - a*
d)*i^2*Log[c + d*x])/(b^3*g^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (2*B*d*(b
*c - a*d)*i^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2)
```

Rubi [A] time = 0.517991, antiderivative size = 313, normalized size of antiderivative = 1.27, number of steps used = 18, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2Bdi^2(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^3g^2}+\frac{2di^2(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2}-\frac{i^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^2,
x]
```

```
[Out] (A*d^2*i^2*x)/(b^2*g^2) - (B*(b*c - a*d)^2*i^2)/(b^3*g^2*(a + b*x)) - (B*d*
(b*c - a*d)*i^2*Log[a + b*x])/(b^3*g^2) - (B*d*(b*c - a*d)*i^2*Log[a + b*x]
^2)/(b^3*g^2) + (B*d^2*i^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^3*g^2
) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2*(a +
b*x)) + (2*d*(b*c - a*d)*i^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/(b^3*g^2) + (2*B*d*(b*c - a*d)*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
 - a*d)])/(b^3*g^2) + (2*B*d*(b*c - a*d)*i^2*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(b^3*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(15c+15dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx = \int \left(\frac{225d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2} + \frac{225(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)^2} + \frac{450\ldots}{\ldots}$$

$$= \frac{\left(225d^2\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b^2g^2} + \frac{(450d(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{b^2g^2} + \ldots$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2(a+bx)} + \frac{450d(bc-ad)\log(a+bx)\ldots}{b^3g^2\ldots}$$

$$= \frac{225Ad^2x}{b^2g^2} + \frac{225Bd^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^2} - \frac{225(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\ldots\right.\right.}{b^3g^2(a+bx)}$$

$$= \frac{225Ad^2x}{b^2g^2} + \frac{225Bd^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^2} - \frac{225(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\ldots\right.\right.}{b^3g^2(a+bx)}$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} + \frac{225Bd^2(a+bx\ldots}{b^3g\ldots}$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} + \frac{225Bd^2(a+bx\ldots}{b^3g\ldots}$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} - \frac{225Bd(bc-ad)\ldots}{b^3g\ldots}$$

$$= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc-ad)^2}{b^3g^2(a+bx)} - \frac{225Bd(bc-ad)\log(a+bx)}{b^3g^2} - \frac{225Bd(bc-ad)\ldots}{b^3g\ldots}$$

Mathematica [A] time = 0.231755, size = 221, normalized size = 0.89

$$\frac{i^2\left(Bd(ad-bc)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2d(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a\ldots}{c+\ldots}\right.\right.\ldots}{b^3g^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^2,x]
```

```
[Out] (i^2*(A*b*d^2*x - (B*(b*c - a*d)^2)/(a + b*x) + B*d*(-(b*c) + a*d)*Log[a +
b*x] + B*d^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - ((b*c - a*d)^2*(A + B
```

```
*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x) + 2*d*(b*c - a*d)*Log[a + b*x]*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]) + B*d*(-(b*c) + a*d)*(Log[a + b*x]*(Log[
a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)])))/(b^3*g^2)
```

Maple [B] time = 0.161, size = 1465, normalized size = 5.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x)
```

```
[Out] e*d*i^2/g^2*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*a+e*d^2*i^2/g^2*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)*a-e*d*i^2/g^2*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)*c+e*d*i^2/g^2*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/
(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2+e*d^3*i^2/g^2*B/b^3*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a^2-e*d*i^2/g^2*A/
b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c-2*d*i^2/g^2*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c+e*d^2*i^2/g^2*A/b
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a+e*d*i^2/g^2*B/b^2/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)*a-e*i^2/g^2*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*c+2*d^2*i^2/g^2*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+e*d*i^2/g^2*A/b^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-2*e*d^2*i^2/g^2*B/b^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*c-e*i^2/g^2*B/b/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-e*i^2/g^2*A/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*
b*c)*c+d*i^2/g^2*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^2*i^2/g^2*B/b^
3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*d^2*i^2/g^2*A/b^3*ln(d*(b*e/d+(a*d-
b*c)*e/d/(d*x+c))-b*e)*a+2*d*i^2/g^2*A/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
c+d*i^2/g^2*B/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-2*d*i^2/g^2*A/b
^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+2*d^2*i^2/g^2*B/b^3*dilog(-(d*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a-2*d*i^2/g^2*B/b^2*dilog(-(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-2*d^2*i^2/g^2*A/b^3*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))*a-d^2*i^2/g^2*B/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a
```

Maxima [B] time = 1.76139, size = 1339, normalized size = 5.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algor
ithm="maxima")
```

```
[Out] -A*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))
*d^2*i^2 + 2*A*c*d*i^2*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2))
 - B*c^2*i^2*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) +
1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x
+ c)/((b^2*c - a*b*d)*g^2)) - A*c^2*i^2/(b^2*g^2*x + a*b*g^2) - (b^2*c^2*d*
i^2 + a*b*c*d^2*i^2 - a^2*d^3*i^2)*B*log(d*x + c)/(b^4*c*g^2 - a*b^3*d*g^2)
 + ((b^3*c*d^2*i^2*log(e) - a*b^2*d^3*i^2*log(e))*B*x^2 + (a*b^2*c*d^2*i^2*
log(e) - a^2*b*d^3*i^2*log(e))*B*x + ((b^3*c^2*d*i^2 - 2*a*b^2*c*d^2*i^2 +
```

```
a^2*b*d^3*i^2)*B*x + (a*b^2*c^2*d*i^2 - 2*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B)
*log(b*x + a)^2 + (2*(i^2*log(e) + i^2)*a*b^2*c^2*d - 3*(i^2*log(e) + i^2)*
a^2*b*c*d^2 + (i^2*log(e) + i^2)*a^3*d^3)*B + ((b^3*c*d^2*i^2 - a*b^2*d^3*i
^2)*B*x^2 + (2*b^3*c^2*d*i^2*log(e) - 4*(i^2*log(e) - i^2)*a*b^2*c*d^2 + (2
*i^2*log(e) - 3*i^2)*a^2*b*d^3)*B*x - (4*a^2*b*c*d^2*i^2*log(e) - 2*(i^2*lo
g(e) + i^2)*a*b^2*c^2*d - (2*i^2*log(e) - i^2)*a^3*d^3)*B)*log(b*x + a) - (
(b^3*c*d^2*i^2 - a*b^2*d^3*i^2)*B*x^2 + (a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2)*B
*x + (2*a*b^2*c^2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B + 2*((b^3*c^2*
d*i^2 - 2*a*b^2*c*d^2*i^2 + a^2*b*d^3*i^2)*B*x + (a*b^2*c^2*d*i^2 - 2*a^2*b
*c*d^2*i^2 + a^3*d^3*i^2)*B)*log(b*x + a))*log(d*x + c))/(a*b^4*c*g^2 - a^2
*b^3*d*g^2 + (b^5*c*g^2 - a*b^4*d*g^2)*x) + 2*(b*c*d*i^2 - a*d^2*i^2)*(log(
b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a
*d)))*B/(b^3*g^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^2i^2x^2 + 2\,Acdi^2x + Ac^2i^2 + \left(Bd^2i^2x^2 + 2\,Bcdi^2x + Bc^2i^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algor
ithm="fricas")
```

```
[Out] integral((A*d^2*i^2*x^2 + 2*A*c*d*i^2*x + A*c^2*i^2 + (B*d^2*i^2*x^2 + 2*B*
c*d*i^2*x + B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g
^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{\left(bgx+ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^
2, x)
```

3.16 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=230

$$\frac{Bd^2i^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^3}-\frac{di^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^3(a+bx)}-\frac{i^2(c+d}{}$$

```
[Out] -((B*d*i^2*(c + d*x))/(b^2*g^3*(a + b*x))) - (B*i^2*(c + d*x)^2)/(4*b*g^3*(
a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g
^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b
*g^3*(a + b*x)^2) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (
b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (B*d^2*i^2*PolyLog[2, (b*(c + d*x)
)/(d*(a + b*x))])/(b^3*g^3)
```

Rubi [A] time = 0.589218, antiderivative size = 338, normalized size of antiderivative = 1.47, number of steps used = 19, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^2i^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^3g^3}+\frac{d^2i^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^3}-\frac{2di^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^3(a+bx)}-\frac{i^2(bc-a}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^3,
x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2)/(4*b^3*g^3*(a + b*x)^2) - (3*B*d*(b*c - a*d)*i^2)/(2
*b^3*g^3*(a + b*x)) - (3*B*d^2*i^2*Log[a + b*x])/(2*b^3*g^3) - (B*d^2*i^2*L
og[a + b*x]^2)/(2*b^3*g^3) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(2*b^3*g^3*(a + b*x)^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(b^3*g^3*(a + b*x)) + (d^2*i^2*Log[a + b*x]*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(b^3*g^3) + (3*B*d^2*i^2*Log[c + d*x])/(2*b^3*g
^3) + (B*d^2*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) + (
B*d^2*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(16c+16dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}dx = \int\left(\frac{256(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)^3}+\frac{512d(bc-ad)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^2g^3(a+bx)^2}\right.$$

$$=\frac{\left(256d^2\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{b^2g^3}+\frac{(512d(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}dx}{b^2g^3}+\frac{(256}{}$$

$$=-\frac{128(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2}-\frac{512d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^3g^3(a+bx)}$$

$$=-\frac{128(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2}-\frac{512d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^3g^3(a+bx)}$$

$$=-\frac{128(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2}-\frac{512d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^3g^3(a+bx)}$$

$$=-\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2}-\frac{384Bd(bc-ad)}{b^3g^3(a+bx)}-\frac{384Bd^2\log(a+bx)}{b^3g^3}-\frac{128(bc-ad)^2}{b^3g}$$

$$=-\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2}-\frac{384Bd(bc-ad)}{b^3g^3(a+bx)}-\frac{384Bd^2\log(a+bx)}{b^3g^3}-\frac{128(bc-ad)^2}{b^3g}$$

$$=-\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2}-\frac{384Bd(bc-ad)}{b^3g^3(a+bx)}-\frac{384Bd^2\log(a+bx)}{b^3g^3}-\frac{128Bd^2\log^2(}{b^3g^3}$$

$$=-\frac{64B(bc-ad)^2}{b^3g^3(a+bx)^2}-\frac{384Bd(bc-ad)}{b^3g^3(a+bx)}-\frac{384Bd^2\log(a+bx)}{b^3g^3}-\frac{128Bd^2\log^2(}{b^3g^3}$$

Mathematica [A] time = 0.332654, size = 244, normalized size = 1.06

$$\frac{i^2\left(-2Bd^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+4d^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right.\right.}{4b^3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^3,x]
```

```
[Out] (i^2*(-((B*(b*c - a*d)^2)/(a + b*x)^2) + (6*B*d*(-(b*c) + a*d))/(a + b*x) -
 6*B*d^2*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(a + b*x)^2 + (8*d*(-(b*c) + a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(a + b*x) + 4*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*B*
d^2*Log[c + d*x] - 2*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(4*b^3*g^3)
```

Maple [B] time = 0.07, size = 1495, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2*e^2*d*i^2/(a*d-b*c)/g^3*A/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/
2*e^2*i^2/(a*d-b*c)/g^3*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-e*d^2*i^2
/(a*d-b*c)/g^3*A/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*d*i^2/(a*d-b*c
)/g^3*A/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+d^3*i^2/(a*d-b*c)/g^3*A/b^3
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-d^2*i^2/(a*d-b*c)/g^3*A/b^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*c-d^3*i^2/(a*d-b*c)/g^3*A/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))-b*e)*a+d^2*i^2/(a*d-b*c)/g^3*A/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-b*e)*c+1/2*d^3*i^2/(a*d-b*c)/g^3*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
^2*a-1/2*d^2*i^2/(a*d-b*c)/g^3*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^
3*i^2/(a*d-b*c)/g^3*B/b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)
*a+d^2*i^2/(a*d-b*c)/g^3*B/b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)
/b/e)*c-d^3*i^2/(a*d-b*c)/g^3*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+d^2*i^2/(a*d-b*c)/g^3*B/b^2*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c
-e*d^2*i^2/(a*d-b*c)/g^3*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*a+e*d*i^2/(a*d-b*c)/g^3*B/b/(b*e/d+e/(d*x+c)*a-e/d/
(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-e*d^2*i^2/(a*d-b*c)/g^3*B/b^
2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*d*i^2/(a*d-b*c)/g^3*B/b/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)*c-1/2*e^2*d*i^2/(a*d-b*c)/g^3*B/b/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/2*e^2*i^2/(a*d-
b*c)/g^3*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*c-1/4*e^2*d*i^2/(a*d-b*c)/g^3*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^2*a+1/4*e^2*i^2/(a*d-b*c)/g^3*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algor
ithm="maxima")
```

```
[Out] -1/2*B*d^2*i^2*((4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b*x + a)
)*log(d*x + c)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) - 2*integrate(1/
2*(2*b^3*d*x^3*log(e) + 7*a^2*b*d*x + 3*a^3*d + 2*(b^3*c*log(e) + 2*a*b^2*d
)*x^2 + 2*(2*b^3*d*x^3 + 3*a^2*b*d*x + a^3*d + (b^3*c + 3*a*b^2*d)*x^2)*log
(b*x + a))/(b^6*d*g^3*x^4 + a^3*b^3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3
 + 3*(a*b^5*c*g^3 + a^2*b^4*d*g^3)*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*
x), x)) - 1/2*B*c*d*i^2*(2*(2*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))
/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*
c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x +
(a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 -
 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c
^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)) + 1/2*A*d^2*i^2*((4*a*b*x + 3*a^2)/(b
^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 1/4
*B*c^2*i^2*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c
 - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) +
a*e/(d*x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x +
a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2
 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - (2*b*x + a)*A*c*d*i^2/(b^4*g^3*x^2 + 2*
a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*A*c^2*i^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a
^2*b*g^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^2i^2x^2+2\,Acdi^2x+Ac^2i^2+\left(Bd^2i^2x^2+2\,Bcdi^2x+Bc^2i^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}{b^3g^3x^3+3\,ab^2g^3x^2+3\,a^2bg^3x+a^3g^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algor
ithm="fricas")
```

```
[Out] integral((A*d^2*i^2*x^2 + 2*A*c*d*i^2*x + A*c^2*i^2 + (B*d^2*i^2*x^2 + 2*B*
c*d*i^2*x + B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2
*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^
3, x)
```

3.17 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=89

$$-\frac{i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4(a+bx)^3(bc-ad)}-\frac{Bi^2(c+dx)^3}{9g^4(a+bx)^3(bc-ad)}$$

```
[Out] -(B*i^2*(c + d*x)^3)/(9*(b*c - a*d)*g^4*(a + b*x)^3) - (i^2*(c + d*x)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)*g^4*(a + b*x)^3)
```

Rubi [B] time = 0.489984, antiderivative size = 287, normalized size of antiderivative = 3.22, number of steps used = 14, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^4(a+bx)}-\frac{di^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^4(a+bx)^2}-\frac{i^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3g^4(a+bx)^3}-\frac{Bd^3i^2\log(a+bx)}{3b^3g^4(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^4,
x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2)/(9*b^3*g^4*(a + b*x)^3) - (B*d*(b*c - a*d)*i^2)/(3*b
^3*g^4*(a + b*x)^2) - (B*d^2*i^2)/(3*b^3*g^4*(a + b*x)) - (B*d^3*i^2*Log[a
+ b*x])/(3*b^3*(b*c - a*d)*g^4) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(3*b^3*g^4*(a + b*x)^3) - (d*(b*c - a*d)*i^2*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(b^3*g^4*(a + b*x)^2) - (d^2*i^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/(b^3*g^4*(a + b*x)) + (B*d^3*i^2*Log[c + d*x])/(3*b^3*(
b*c - a*d)*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(17c+17dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx = \int\left(\frac{289(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^4(a+bx)^4}+\frac{578d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^4(a+bx)^3}\right.$$

$$=\frac{\left(289d^2\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{b^2g^4}+\frac{(578d(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{b^2g^4}+\frac{(289}{}$$

$$=-\frac{289(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^3g^4(a+bx)^3}-\frac{289d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^4(a+bx)^2}$$

$$=-\frac{289(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^3g^4(a+bx)^3}-\frac{289d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^4(a+bx)^2}$$

$$=-\frac{289(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^3g^4(a+bx)^3}-\frac{289d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^4(a+bx)^2}$$

$$=-\frac{289B(bc-ad)^2}{9b^3g^4(a+bx)^3}-\frac{289Bd(bc-ad)}{3b^3g^4(a+bx)^2}-\frac{289Bd^2}{3b^3g^4(a+bx)}-\frac{289Bd^3\log(a+b}{3b^3(bc-ad)g^4}$$

Mathematica [B] time = 0.318232, size = 315, normalized size = 3.54

$$-\frac{i^2\left(-9a^2Abd^3x-3a^3Ad^3+3B(bc-ad)\left(a^2d^2+abd(c+3dx)+b^2\left(c^2+3cdx+3d^2x^2\right)\right)\log\left(\frac{e(a+bx)}{c+dx}\right)-9a^2bBd^3x\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^4,x]
```

```
[Out] -(i^2*(3*A*b^3*c^3 + b^3*B*c^3 - 3*a^3*A*d^3 - a^3*B*d^3 + 9*A*b^3*c^2*d*x
+ 3*b^3*B*c^2*d*x - 9*a^2*A*b*d^3*x - 3*a^2*b*B*d^3*x + 9*A*b^3*c*d^2*x^2 +
 3*b^3*B*c*d^2*x^2 - 9*a*A*b^2*d^3*x^2 - 3*a*b^2*B*d^3*x^2 + 3*B*d^3*(a + b
*x)^3*Log[a + b*x] + 3*B*(b*c - a*d)*(a^2*d^2 + a*b*d*(c + 3*d*x) + b^2*(c^
2 + 3*c*d*x + 3*d^2*x^2))*Log[(e*(a + b*x))/(c + d*x)] - 3*a^3*B*d^3*Log[c
+ d*x] - 9*a^2*b*B*d^3*x*Log[c + d*x] - 9*a*b^2*B*d^3*x^2*Log[c + d*x] - 3*
b^3*B*d^3*x^3*Log[c + d*x]))/(9*b^3*(b*c - a*d)*g^4*(a + b*x)^3)
```

Maple [B] time = 0.055, size = 406, normalized size = 4.6

$$\frac{de^3i^2Aa}{3\,(ad-bc)^2\,g^4}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)\,d}\right)^{-3}-\frac{e^3i^2Abc}{3\,(ad-bc)^2\,g^4}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)\,d}\right)^{-3}+\frac{de^3i^2Ba}{3\,(ad-bc)^2\,g^4}\ln\left(\frac{be}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x)
```

```
[Out] 1/3*e^3*d*i^2/(a*d-b*c)^2/g^4*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/3
*e^3*i^2/(a*d-b*c)^2/g^4*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c+1/3*e^
3*d*i^2/(a*d-b*c)^2/g^4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*a-1/3*e^3*i^2/(a*d-b*c)^2/g^4*B/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/9*e^3*d*i^2/(a*d-b*c)
^2/g^4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/9*e^3*i^2/(a*d-b*c)^2/g^
4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c
```

Maxima [B] time = 1.58937, size = 2045, normalized size = 22.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="maxima")
```

```
[Out] -1/18*B*d^2*i^2*(6*(3*b^2*x^2 + 3*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d
*x + c))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) +
(11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^
2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2
 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*
b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a
^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d
^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^
3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((b^
6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4)) - 1/18*B*c*d*i
^2*(6*(3*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^4*x^3 + 3*a*b
^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + (5*a*b^2*c^2 - 22*a^2*b*c*d +
 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d +
5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c
^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d
+ a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6
*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d
^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a
*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/18*B*c^2*i^2*((6*b^2*
d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/(
(b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*
d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^
4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*log(b*e*x/(d*x + c
) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b
*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^
3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*
d^2 - a^3*b*d^3)*g^4)) - 1/3*(3*b*x + a)*A*c*d*i^2/(b^5*g^4*x^3 + 3*a*b^4*g
^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*A
*d^2*i^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) -
1/3*A*c^2*i^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 0.780945, size = 544, normalized size = 6.11

$$-\frac{3\left(\left(3A+B\right)b^3cd^2-\left(3A+B\right)ab^2d^3\right)i^2x^2+3\left(\left(3A+B\right)b^3c^2d-\left(3A+B\right)a^2bd^3\right)i^2x+\left(\left(3A+B\right)b^3c^3-\left(3A+B\right)a^3d^3\right)i^2}{9\left(\left(b^7c-ab^6d\right)g^4x^3+3\left(ab^6c-a^2b^5d\right)g^4x^2+3\left(a^2b^5c-a^3b^4d\right)g^4x+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="fricas")
```

```
[Out] -1/9*(3*((3*A + B)*b^3*c*d^2 - (3*A + B)*a*b^2*d^3)*i^2*x^2 + 3*((3*A + B)*
b^3*c^2*d - (3*A + B)*a^2*b*d^3)*i^2*x + ((3*A + B)*b^3*c^3 - (3*A + B)*a^3
*d^3)*i^2 + 3*(B*b^3*d^3*i^2*x^3 + 3*B*b^3*c*d^2*i^2*x^2 + 3*B*b^3*c^2*d*i^
2*x + B*b^3*c^3*i^2)*log((b*e*x + a*e)/(d*x + c)))/((b^7*c - a*b^6*d)*g^4*x
^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*x^2 + 3*(a^2*b^5*c - a^3*b^4*d)*g^4*x + (a
^3*b^4*c - a^4*b^3*d)*g^4)
```

Sympy [B] time = 26.5454, size = 610, normalized size = 6.85

$$-\frac{Bd^3i^2\log\left(x+\frac{-\frac{Ba^2d^5i^2}{ad-bc}+\frac{2Babcd^4i^2}{ad-bc}+Bad^4i^2-\frac{Bb^2c^2d^3i^2}{ad-bc}+Bbcd^3i^2}{2Bbd^4i^2}\right)}{3b^3g^4(ad-bc)}+\frac{Bd^3i^2\log\left(x+\frac{\frac{Ba^2d^5i^2}{ad-bc}-\frac{2Babcd^4i^2}{ad-bc}+Bad^4i^2+\frac{Bb^2c^2d^3i^2}{ad-bc}+Bbcd^3i^2}{2Bbd^4i^2}\right)}{3b^3g^4(ad-bc)}-\frac{3Aa^2\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*d**3*i**2*log(x + (-B*a**2*d**5*i**2/(a*d - b*c) + 2*B*a*b*c*d**4*i**2/(
a*d - b*c) + B*a*d**4*i**2 - B*b**2*c**2*d**3*i**2/(a*d - b*c) + B*b*c*d**3
*i**2)/(2*B*b*d**4*i**2))/(3*b**3*g**4*(a*d - b*c)) + B*d**3*i**2*log(x + (
B*a**2*d**5*i**2/(a*d - b*c) - 2*B*a*b*c*d**4*i**2/(a*d - b*c) + B*a*d**4*i
**2 + B*b**2*c**2*d**3*i**2/(a*d - b*c) + B*b*c*d**3*i**2)/(2*B*b*d**4*i**2
))/(3*b**3*g**4*(a*d - b*c)) - (3*A*a**2*d**2*i**2 + 3*A*a*b*c*d*i**2 + 3*A
*b**2*c**2*i**2 + B*a**2*d**2*i**2 + B*a*b*c*d*i**2 + B*b**2*c**2*i**2 + x*
*2*(9*A*b**2*d**2*i**2 + 3*B*b**2*d**2*i**2) + x*(9*A*a*b*d**2*i**2 + 9*A*b
**2*c*d*i**2 + 3*B*a*b*d**2*i**2 + 3*B*b**2*c*d*i**2))/(9*a**3*b**3*g**4 +
27*a**2*b**4*g**4*x + 27*a*b**5*g**4*x**2 + 9*b**6*g**4*x**3) + (-B*a**2*d*
*2*i**2 - B*a*b*c*d*i**2 - 3*B*a*b*d**2*i**2*x - B*b**2*c**2*i**2 - 3*B*b**
2*c*d*i**2*x - 3*B*b**2*d**2*i**2*x**2)*log(e*(a + b*x)/(c + d*x))/(3*a**3*
b**3*g**4 + 9*a**2*b**4*g**4*x + 9*a*b**5*g**4*x**2 + 3*b**6*g**4*x**3)
```

Giac [B] time = 1.31054, size = 463, normalized size = 5.2

$$\frac{Bd^3\log(bx+a)}{3\left(b^4cg^4-ab^3dg^4\right)}-\frac{Bd^3\log(dx+c)}{3\left(b^4cg^4-ab^3dg^4\right)}+\frac{\left(3\,Bb^2d^2x^2+3\,Bb^2cdx+3\,Babd^2x+Bb^2c^2+Babcd+Ba^2d^2\right)\log\left(\frac{bx+a}{dx+c}\right)}{3\left(b^6g^4x^3+3\,ab^5g^4x^2+3\,a^2b^4g^4x+a^3b^3g^4\right)}+\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="giac")
```

```
[Out] 1/3*B*d^3*log(b*x + a)/(b^4*c*g^4 - a*b^3*d*g^4) - 1/3*B*d^3*log(d*x + c)/(
b^4*c*g^4 - a*b^3*d*g^4) + 1/3*(3*B*b^2*d^2*x^2 + 3*B*b^2*c*d*x + 3*B*a*b*d
^2*x + B*b^2*c^2 + B*a*b*c*d + B*a^2*d^2)*log((b*x + a)/(d*x + c))/(b^6*g^4
*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + 1/9*(9*A*b^2*d^2*
x^2 + 12*B*b^2*d^2*x^2 + 9*A*b^2*c*d*x + 12*B*b^2*c*d*x + 9*A*a*b*d^2*x + 1
2*B*a*b*d^2*x + 3*A*b^2*c^2 + 4*B*b^2*c^2 + 3*A*a*b*c*d + 4*B*a*b*c*d + 3*A
*a^2*d^2 + 4*B*a^2*d^2)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x +
a^3*b^3*g^4)
```

3.18 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=181

$$-\frac{bi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^2}-\frac{bBi^2(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^2}+\frac{Bdi^2(c+dx)^3}{9g^5(a+bx)^3(bc-a}$$

```
[Out] (B*d*i^2*(c + d*x)^3)/(9*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B*i^2*(c + d*x
)^4)/(16*(b*c - a*d)^2*g^5*(a + b*x)^4) + (d*i^2*(c + d*x)^3*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*i^2*(c + d*x
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Rubi [A] time = 0.571379, antiderivative size = 325, normalized size of antiderivative = 1.8, number of steps used = 14, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^3g^5(a+bx)^2}-\frac{2di^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3g^5(a+bx)^3}-\frac{i^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^3g^5(a+bx)^4}+\frac{Bd^3i^2}{12b^3g^5(a+bx)(b}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^5,
x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2)/(16*b^3*g^5*(a + b*x)^4) - (5*B*d*(b*c - a*d)*i^2)/(
36*b^3*g^5*(a + b*x)^3) - (B*d^2*i^2)/(24*b^3*g^5*(a + b*x)^2) + (B*d^3*i^2
)/(12*b^3*(b*c - a*d)*g^5*(a + b*x)) + (B*d^4*i^2*Log[a + b*x])/(12*b^3*(b*
c - a*d)^2*g^5) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(4*b^3*g^5*(a + b*x)^4) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(3*b^3*g^5*(a + b*x)^3) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(c +
d*x)]))/(2*b^3*g^5*(a + b*x)^2) - (B*d^4*i^2*Log[c + d*x])/(12*b^3*(b*c - a
*d)^2*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(18c+18dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx = \int \left(\frac{324(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^5(a+bx)^5} + \frac{648d(bc-ad)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^2g^5(a+bx)^4}\right.$$

$$= \frac{\left(324d^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{b^2g^5} + \frac{(648d(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{b^2g^5} + \frac{(324}{}$$

$$= -\frac{81(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{216d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^3}$$

$$= -\frac{81(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{216d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^3}$$

$$= -\frac{81(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{216d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^3}$$

$$= -\frac{81B(bc-ad)^2}{4b^3g^5(a+bx)^4} - \frac{45Bd(bc-ad)}{b^3g^5(a+bx)^3} - \frac{27Bd^2}{2b^3g^5(a+bx)^2} + \frac{27Bd^3}{b^3(bc-ad)g^5(a+}$$

Mathematica [B] time = 0.38713, size = 454, normalized size = 2.51

$$-\frac{i^2\left(72a^2Ab^2d^4x^2+48a^3Abd^4x+12a^4Ad^4+12B(bc-ad)^2\left(a^2d^2+2abd(c+2dx)+b^2\left(3c^2+8cdx+6d^2x^2\right)\right)\log\left(\frac{e(}{c}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^5,x]
```

```
[Out] -(i^2*(36*A*b^4*c^4 + 9*b^4*B*c^4 - 48*a*A*b^3*c^3*d - 16*a*b^3*B*c^3*d + 1
2*a^4*A*d^4 + 7*a^4*B*d^4 + 96*A*b^4*c^3*d*x + 20*b^4*B*c^3*d*x - 144*a*A*b
^3*c^2*d^2*x - 48*a*b^3*B*c^2*d^2*x + 48*a^3*A*b*d^4*x + 28*a^3*b*B*d^4*x +
 72*A*b^4*c^2*d^2*x^2 + 6*b^4*B*c^2*d^2*x^2 - 144*a*A*b^3*c*d^3*x^2 - 48*a*
b^3*B*c*d^3*x^2 + 72*a^2*A*b^2*d^4*x^2 + 42*a^2*b^2*B*d^4*x^2 - 12*b^4*B*c*
d^3*x^3 + 12*a*b^3*B*d^4*x^3 - 12*B*d^4*(a + b*x)^4*Log[a + b*x] + 12*B*(b*
c - a*d)^2*(a^2*d^2 + 2*a*b*d*(c + 2*d*x) + b^2*(3*c^2 + 8*c*d*x + 6*d^2*x^
2))*Log[(e*(a + b*x))/(c + d*x)] + 12*a^4*B*d^4*Log[c + d*x] + 48*a^3*b*B*d
^4*x*Log[c + d*x] + 72*a^2*b^2*B*d^4*x^2*Log[c + d*x] + 48*a*b^3*B*d^4*x^3*
Log[c + d*x] + 12*b^4*B*d^4*x^4*Log[c + d*x]))/(144*b^3*(b*c - a*d)^2*g^5*(
a + b*x)^4)
```

Maple [B] time = 0.05, size = 828, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x)
```

```
[Out] 1/3*e^3*d^2*i^2/(a*d-b*c)^3/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1
/3*e^3*d*i^2/(a*d-b*c)^3/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-1/
4*e^4*d*i^2/(a*d-b*c)^3/g^5*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/4
*e^4*i^2/(a*d-b*c)^3/g^5*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+1/3*
e^3*d^2*i^2/(a*d-b*c)^3/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*a-1/3*e^3*d*i^2/(a*d-b*c)^3/g^5*B/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/9*e^3*d^2*i^2/(
a*d-b*c)^3/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/9*e^3*d*i^2/(a*d
-b*c)^3/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-1/4*e^4*d*i^2/(a*d-
b*c)^3/g^5*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*a+1/4*e^4*i^2/(a*d-b*c)^3/g^5*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/16*e^4*d*i^2/(a*d-b*c)^3/g^5*B
*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/16*e^4*i^2/(a*d-b*c)^3/g^5*B*b
^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c
```

Maxima [B] time = 1.78848, size = 2994, normalized size = 16.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="maxima")
```

```
[Out] -1/144*B*d^2*i^2*(12*(6*b^2*x^2 + 4*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/
(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g
^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 -
 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*
c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*
c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*
a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2
*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^
3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a
^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*
b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b
*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^
2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 +
 a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^
3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/72*B*c*d*i^2*(12*(4*b*x + a)*log(b*e*x
/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*
x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75
*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2
*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d +
57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c
*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*
d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c
*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*
c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d
^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*
a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*
(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*
d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) + 1/48*B*c^2*i^2*((12*b^3*d^3*x^
3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2
```

```
 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8
*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^
3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c
^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*
c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3
 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 12*log(b*e*x/(d*x
+ c) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 +
4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*
d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x
+ c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*
b*d^4)*g^5)) - 1/6*(4*b*x + a)*A*c*d*i^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6
*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/12*(6*b^2*x^2 + 4*a*b
*x + a^2)*A*d^2*i^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*
a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/4*A*c^2*i^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 0.813267, size = 1046, normalized size = 5.78

$$\frac{12\left(Bb^4cd^3 - Bab^3d^4\right)i^2x^3 - 6\left((12\,A + B)b^4c^2d^2 - 8\,(3\,A + B)ab^3cd^3 + (12\,A + 7\,B)a^2b^2d^4\right)i^2x^2 - 4\left((24\,A + 5\,B)b^4c^3d \cdots\right.}{144\left(\left(b^9c^2 - 2\,ab^8cd + a^2b^7 \cdots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="fricas")
```

```
[Out] 1/144*(12*(B*b^4*c*d^3 - B*a*b^3*d^4)*i^2*x^3 - 6*((12*A + B)*b^4*c^2*d^2 -
 8*(3*A + B)*a*b^3*c*d^3 + (12*A + 7*B)*a^2*b^2*d^4)*i^2*x^2 - 4*((24*A + 5
*B)*b^4*c^3*d - 12*(3*A + B)*a*b^3*c^2*d^2 + (12*A + 7*B)*a^3*b*d^4)*i^2*x
- (9*(4*A + B)*b^4*c^4 - 16*(3*A + B)*a*b^3*c^3*d + (12*A + 7*B)*a^4*d^4)*i
^2 + 12*(B*b^4*d^4*i^2*x^4 + 4*B*a*b^3*d^4*i^2*x^3 - 6*(B*b^4*c^2*d^2 - 2*B
*a*b^3*c*d^3)*i^2*x^2 - 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2)*i^2*x - (3*B*
b^4*c^4 - 4*B*a*b^3*c^3*d)*i^2)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^2 - 2
*a*b^8*c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*
d^2)*g^5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a
^3*b^6*c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*
c*d + a^6*b^3*d^2)*g^5)
```

Sympy [B] time = 48.2751, size = 928, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*d**4*i**2*log(x + (-B*a**3*d**7*i**2/(a*d - b*c)**2 + 3*B*a**2*b*c*d**6*
i**2/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**5*i**2/(a*d - b*c)**2 + B*a*d**5*i
**2 + B*b**3*c**3*d**4*i**2/(a*d - b*c)**2 + B*b*c*d**4*i**2)/(2*B*b*d**5*i
**2))/(12*b**3*g**5*(a*d - b*c)**2) + B*d**4*i**2*log(x + (B*a**3*d**7*i**2
/(a*d - b*c)**2 - 3*B*a**2*b*c*d**6*i**2/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d
**5*i**2/(a*d - b*c)**2 + B*a*d**5*i**2 - B*b**3*c**3*d**4*i**2/(a*d - b*c)
**2 + B*b*c*d**4*i**2)/(2*B*b*d**5*i**2))/(12*b**3*g**5*(a*d - b*c)**2) - (
12*A*a**3*d**3*i**2 + 12*A*a**2*b*c*d**2*i**2 + 12*A*a*b**2*c**2*d*i**2 - 3
```

```
6*A*b**3*c**3*i**2 + 7*B*a**3*d**3*i**2 + 7*B*a**2*b*c*d**2*i**2 + 7*B*a*b*
*2*c**2*d*i**2 - 9*B*b**3*c**3*i**2 + 12*B*b**3*d**3*i**2*x**3 + x**2*(72*A
*a*b**2*d**3*i**2 - 72*A*b**3*c*d**2*i**2 + 42*B*a*b**2*d**3*i**2 - 6*B*b**
3*c*d**2*i**2) + x*(48*A*a**2*b*d**3*i**2 + 48*A*a*b**2*c*d**2*i**2 - 96*A*
b**3*c**2*d*i**2 + 28*B*a**2*b*d**3*i**2 + 28*B*a*b**2*c*d**2*i**2 - 20*B*b
**3*c**2*d*i**2))/(144*a**5*b**3*d*g**5 - 144*a**4*b**4*c*g**5 + x**4*(144*
a*b**7*d*g**5 - 144*b**8*c*g**5) + x**3*(576*a**2*b**6*d*g**5 - 576*a*b**7*
c*g**5) + x**2*(864*a**3*b**5*d*g**5 - 864*a**2*b**6*c*g**5) + x*(576*a**4*
b**4*d*g**5 - 576*a**3*b**5*c*g**5)) + (-B*a**2*d**2*i**2 - 2*B*a*b*c*d*i**
2 - 4*B*a*b*d**2*i**2*x - 3*B*b**2*c**2*i**2 - 8*B*b**2*c*d*i**2*x - 6*B*b*
*2*d**2*i**2*x**2)*log(e*(a + b*x)/(c + d*x))/(12*a**4*b**3*g**5 + 48*a**3*
b**4*g**5*x + 72*a**2*b**5*g**5*x**2 + 48*a*b**6*g**5*x**3 + 12*b**7*g**5*x
**4)
```

Giac [B] time = 1.715, size = 783, normalized size = 4.33

$$-\frac{Bd^4\log(bx+a)}{12\left(b^5c^2g^5-2\,ab^4cdg^5+a^2b^3d^2g^5\right)}+\frac{Bd^4\log(dx+c)}{12\left(b^5c^2g^5-2\,ab^4cdg^5+a^2b^3d^2g^5\right)}+\frac{\left(6\,Bb^2d^2x^2+8\,Bb^2cdx+4\,Babd^2x+3\,Bb^2\right.}{12\left(b^7g^5x^4+4\,ab^6g^5x^3+6\,a^2b^5g^5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="giac")
```

```
[Out] -1/12*B*d^4*log(b*x + a)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*g^5)
+ 1/12*B*d^4*log(d*x + c)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*g^5)
 + 1/12*(6*B*b^2*d^2*x^2 + 8*B*b^2*c*d*x + 4*B*a*b*d^2*x + 3*B*b^2*c^2 + 2*
B*a*b*c*d + B*a^2*d^2)*log((b*x + a)/(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*
x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/144*(12*B*b^3*
d^3*x^3 - 72*A*b^3*c*d^2*x^2 - 78*B*b^3*c*d^2*x^2 + 72*A*a*b^2*d^3*x^2 + 11
4*B*a*b^2*d^3*x^2 - 96*A*b^3*c^2*d*x - 116*B*b^3*c^2*d*x + 48*A*a*b^2*c*d^2
*x + 76*B*a*b^2*c*d^2*x + 48*A*a^2*b*d^3*x + 76*B*a^2*b*d^3*x - 36*A*b^3*c^
3 - 45*B*b^3*c^3 + 12*A*a*b^2*c^2*d + 19*B*a*b^2*c^2*d + 12*A*a^2*b*c*d^2 +
 19*B*a^2*b*c*d^2 + 12*A*a^3*d^3 + 19*B*a^3*d^3)/(b^8*c*g^5*x^4 - a*b^7*d*g
^5*x^4 + 4*a*b^7*c*g^5*x^3 - 4*a^2*b^6*d*g^5*x^3 + 6*a^2*b^6*c*g^5*x^2 - 6*
a^3*b^5*d*g^5*x^2 + 4*a^3*b^5*c*g^5*x - 4*a^4*b^4*d*g^5*x + a^4*b^4*c*g^5 -
 a^5*b^3*d*g^5)
```

3.19 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=281

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^6(a+bx)^3(bc-ad)^3}+\frac{bdi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^6(a+bx)^4(bc-ad)^3}-\frac{}{25g}$$

```
[Out] -(B*d^2*i^2*(c + d*x)^3)/(9*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B*d*i^2*(c
+ d*x)^4)/(8*(b*c - a*d)^3*g^6*(a + b*x)^4) - (b^2*B*i^2*(c + d*x)^5)/(25*(
b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(3*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*d*i^2*(c + d*x)^4*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^6*(a + b*x)^4) - (b^
2*i^2*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*(b*c - a*d)^3*g^
6*(a + b*x)^5)
```

Rubi [A] time = 0.678321, antiderivative size = 359, normalized size of antiderivative = 1.28, number of steps used = 14, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3g^6(a+bx)^3}-\frac{di^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^3g^6(a+bx)^4}-\frac{i^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b^3g^6(a+bx)^5}-\frac{Bd^4i^2}{30b^3g^6(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^6,
x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2)/(25*b^3*g^6*(a + b*x)^5) - (3*B*d*(b*c - a*d)*i^2)/(
40*b^3*g^6*(a + b*x)^4) - (B*d^2*i^2)/(90*b^3*g^6*(a + b*x)^3) + (B*d^3*i^2
)/(60*b^3*(b*c - a*d)*g^6*(a + b*x)^2) - (B*d^4*i^2)/(30*b^3*(b*c - a*d)^2*
g^6*(a + b*x)) - (B*d^5*i^2*Log[a + b*x])/(30*b^3*(b*c - a*d)^3*g^6) - ((b*
c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b^3*g^6*(a + b*x)^5
) - (d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^3*g^6*(a
+ b*x)^4) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^3*g^6*(a +
b*x)^3) + (B*d^5*i^2*Log[c + d*x])/(30*b^3*(b*c - a*d)^3*g^6)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(19c+19dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx = \int\left(\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^6(a+bx)^6}+\frac{722d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^6(a+bx)^5}\right.$$

$$=\frac{\left(361d^2\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{b^2g^6}+\frac{(722d(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5}\,dx}{b^2g^6}+\frac{(361(bc}{}$$

$$=-\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^3g^6(a+bx)^5}-\frac{361d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^3g^6(a+bx)^4}-$$

$$=-\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^3g^6(a+bx)^5}-\frac{361d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^3g^6(a+bx)^4}-$$

$$=-\frac{361(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^3g^6(a+bx)^5}-\frac{361d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^3g^6(a+bx)^4}-$$

$$=-\frac{361B(bc-ad)^2}{25b^3g^6(a+bx)^5}-\frac{1083Bd(bc-ad)}{40b^3g^6(a+bx)^4}-\frac{361Bd^2}{90b^3g^6(a+bx)^3}+\frac{361Bd^3}{60b^3(bc-ad)g^6(}$$

Mathematica [A] time = 0.888242, size = 344, normalized size = 1.22

$$\frac{i^2\left(-\frac{360a^2Ad^2}{(a+bx)^5}-\frac{60B\left(a^2d^2+abd(3c+5dx)+b^2\left(6c^2+15cdx+10d^2x^2\right)\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5}-\frac{72a^2Bd^2}{(a+bx)^5}-\frac{360Ab^2c^2}{(a+bx)^5}-\frac{900Abcd}{(a+bx)^4}+\frac{720aAbcd}{(a+bx)^5}-\frac{600Ad^2}{(a+bx)^3}+\frac{900aA}{(a+bx}\right.}{1800b^3g^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^6,x]
```

```
[Out] (i^2*((-360*A*b^2*c^2)/(a + b*x)^5 - (72*b^2*B*c^2)/(a + b*x)^5 + (720*a*A*
b*c*d)/(a + b*x)^5 + (144*a*b*B*c*d)/(a + b*x)^5 - (360*a^2*A*d^2)/(a + b*x
)^5 - (72*a^2*B*d^2)/(a + b*x)^5 - (900*A*b*c*d)/(a + b*x)^4 - (135*b*B*c*d
)/(a + b*x)^4 + (900*a*A*d^2)/(a + b*x)^4 + (135*a*B*d^2)/(a + b*x)^4 - (60
0*A*d^2)/(a + b*x)^3 - (20*B*d^2)/(a + b*x)^3 + (30*B*d^3)/((b*c - a*d)*(a
+ b*x)^2) - (60*B*d^4)/((b*c - a*d)^2*(a + b*x)) - (60*B*d^5*Log[a + b*x])/
(b*c - a*d)^3 - (60*B*(a^2*d^2 + a*b*d*(3*c + 5*d*x) + b^2*(6*c^2 + 15*c*d*
x + 10*d^2*x^2))*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^5 + (60*B*d^5*Log[
c + d*x])/(b*c - a*d)^3))/(1800*b^3*g^6)
```

Maple [B] time = 0.054, size = 1262, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x)
```

```
[Out] 1/3*e^3*d^3*i^2/(a*d-b*c)^4/g^6*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1
/3*e^3*d^2*i^2/(a*d-b*c)^4/g^6*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-
1/2*e^4*d^2*i^2/(a*d-b*c)^4/g^6*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a
+1/2*e^4*d*i^2/(a*d-b*c)^4/g^6*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*
c+1/5*e^5*d*i^2/(a*d-b*c)^4/g^6*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5
*a-1/5*e^5*i^2/(a*d-b*c)^4/g^6*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*
c+1/3*e^3*d^3*i^2/(a*d-b*c)^4/g^6*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/3*e^3*d^2*i^2/(a*d-b*c)^4/g^6*B/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/9*e^3*d
^3*i^2/(a*d-b*c)^4/g^6*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/9*e^3*d^
2*i^2/(a*d-b*c)^4/g^6*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-1/2*e^4*d
^2*i^2/(a*d-b*c)^4/g^6*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*a+1/2*e^4*d*i^2/(a*d-b*c)^4/g^6*B*b^2/(b*e/d+e/(d*x+c
)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/8*e^4*d^2*i^2/(a
*d-b*c)^4/g^6*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/8*e^4*d*i^2/(a*
d-b*c)^4/g^6*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+1/5*e^5*d*i^2/(a
*d-b*c)^4/g^6*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*a-1/5*e^5*i^2/(a*d-b*c)^4/g^6*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/25*e^5*d*i^2/(a*d-b*c)^4/
g^6*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a-1/25*e^5*i^2/(a*d-b*c)^4/
g^6*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c
```

Maxima [B] time = 2.69166, size = 4089, normalized size = 14.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="maxima")
```

```
[Out] -1/1800*B*d^2*i^2*(60*(10*b^2*x^2 + 5*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*
e/(d*x + c))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b
^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + (47*a^2*b^4*c^4 - 278*a^3*b^3
*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^
2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*
d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^
3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35
*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 +
47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b
^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*
b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4
*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3
 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3
+ a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d
^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d
+ 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*
d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^
```

```
2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) -
60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^
7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b
^3*d^5)*g^6)) - 1/600*B*c*d*i^2*(60*(5*b*x + a)*log(b*e*x/(d*x + c) + a*e/(
d*x + c))/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*
g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) + (27*a*b^4*c^4 - 148*a^2*b^3*c^3*
d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 -
a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 -
10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x
^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d
^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a
^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a
^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 -
 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x
^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^
3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2
*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*
d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4
 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*
a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d
^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^
4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) - 1/300*B*c^2*i^2*((60*b^4
*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*
d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 -
13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 +
43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*
c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8
*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a
^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^
4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*
a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6
*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*
a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*
log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^
2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6) + 60*d^5*
log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^
2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 -
 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4
- a^5*b*d^5)*g^6)) - 1/10*(5*b*x + a)*A*c*d*i^2/(b^7*g^6*x^5 + 5*a*b^6*g^6*
x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g
^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*A*d^2*i^2/(b^8*g^6*x^5 + 5*a*b^7*g^
6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3
*g^6) - 1/5*A*c^2*i^2/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 +
 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6)
```

Fricas [B] time = 0.796824, size = 1661, normalized size = 5.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="fricas")
```

```
[Out] -1/1800*(60*(B*b^5*c*d^4 - B*a*b^4*d^5)*i^2*x^4 - 30*(B*b^5*c^2*d^3 - 10*B*
a*b^4*c*d^4 + 9*B*a^2*b^3*d^5)*i^2*x^3 + 10*(2*(30*A + B)*b^5*c^3*d^2 - 15*
(12*A + B)*a*b^4*c^2*d^3 + 60*(3*A + B)*a^2*b^3*c*d^4 - (60*A + 47*B)*a^3*b
```

```
^2*d^5)*i^2*x^2 + 5*(9*(20*A + 3*B)*b^5*c^4*d - 20*(24*A + 5*B)*a*b^4*c^3*d
^2 + 120*(3*A + B)*a^2*b^3*c^2*d^3 - (60*A + 47*B)*a^4*b*d^5)*i^2*x + (72*(
5*A + B)*b^5*c^5 - 225*(4*A + B)*a*b^4*c^4*d + 200*(3*A + B)*a^2*b^3*c^3*d^
2 - (60*A + 47*B)*a^5*d^5)*i^2 + 60*(B*b^5*d^5*i^2*x^5 + 5*B*a*b^4*d^5*i^2*
x^4 + 10*B*a^2*b^3*d^5*i^2*x^3 + 10*(B*b^5*c^3*d^2 - 3*B*a*b^4*c^2*d^3 + 3*
B*a^2*b^3*c*d^4)*i^2*x^2 + 5*(3*B*b^5*c^4*d - 8*B*a*b^4*c^3*d^2 + 6*B*a^2*b
^3*c^2*d^3)*i^2*x + (6*B*b^5*c^5 - 15*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)
*i^2)*log((b*e*x + a*e)/(d*x + c)))/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9
*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8
*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b
^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5
*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^
6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b
^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

Sympy [B] time = 88.4711, size = 1300, normalized size = 4.63

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**6,x)
```

```
[Out] -B*d**5*i**2*log(x + (-B*a**4*d**9*i**2/(a*d - b*c)**3 + 4*B*a**3*b*c*d**8*
i**2/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**7*i**2/(a*d - b*c)**3 + 4*B*a*b
**3*c**3*d**6*i**2/(a*d - b*c)**3 + B*a*d**6*i**2 - B*b**4*c**4*d**5*i**2/(
a*d - b*c)**3 + B*b*c*d**5*i**2)/(2*B*b*d**6*i**2))/(30*b**3*g**6*(a*d - b*
c)**3) + B*d**5*i**2*log(x + (B*a**4*d**9*i**2/(a*d - b*c)**3 - 4*B*a**3*b*
c*d**8*i**2/(a*d - b*c)**3 + 6*B*a**2*b**2*c**2*d**7*i**2/(a*d - b*c)**3 -
4*B*a*b**3*c**3*d**6*i**2/(a*d - b*c)**3 + B*a*d**6*i**2 + B*b**4*c**4*d**5
*i**2/(a*d - b*c)**3 + B*b*c*d**5*i**2)/(2*B*b*d**6*i**2))/(30*b**3*g**6*(a
*d - b*c)**3) - (60*A*a**4*d**4*i**2 + 60*A*a**3*b*c*d**3*i**2 + 60*A*a**2*
b**2*c**2*d**2*i**2 - 540*A*a*b**3*c**3*d*i**2 + 360*A*b**4*c**4*i**2 + 47*
B*a**4*d**4*i**2 + 47*B*a**3*b*c*d**3*i**2 + 47*B*a**2*b**2*c**2*d**2*i**2
- 153*B*a*b**3*c**3*d*i**2 + 72*B*b**4*c**4*i**2 + 60*B*b**4*d**4*i**2*x**4
 + x**3*(270*B*a*b**3*d**4*i**2 - 30*B*b**4*c*d**3*i**2) + x**2*(600*A*a**2
*b**2*d**4*i**2 - 1200*A*a*b**3*c*d**3*i**2 + 600*A*b**4*c**2*d**2*i**2 + 4
70*B*a**2*b**2*d**4*i**2 - 130*B*a*b**3*c*d**3*i**2 + 20*B*b**4*c**2*d**2*i
**2) + x*(300*A*a**3*b*d**4*i**2 + 300*A*a**2*b**2*c*d**3*i**2 - 1500*A*a*b
**3*c**2*d**2*i**2 + 900*A*b**4*c**3*d*i**2 + 235*B*a**3*b*d**4*i**2 + 235*
B*a**2*b**2*c*d**3*i**2 - 365*B*a*b**3*c**2*d**2*i**2 + 135*B*b**4*c**3*d*i
**2))/(1800*a**7*b**3*d**2*g**6 - 3600*a**6*b**4*c*d*g**6 + 1800*a**5*b**5*
c**2*g**6 + x**5*(1800*a**2*b**8*d**2*g**6 - 3600*a*b**9*c*d*g**6 + 1800*b*
*10*c**2*g**6) + x**4*(9000*a**3*b**7*d**2*g**6 - 18000*a**2*b**8*c*d*g**6
+ 9000*a*b**9*c**2*g**6) + x**3*(18000*a**4*b**6*d**2*g**6 - 36000*a**3*b**
7*c*d*g**6 + 18000*a**2*b**8*c**2*g**6) + x**2*(18000*a**5*b**5*d**2*g**6 -
 36000*a**4*b**6*c*d*g**6 + 18000*a**3*b**7*c**2*g**6) + x*(9000*a**6*b**4*
d**2*g**6 - 18000*a**5*b**5*c*d*g**6 + 9000*a**4*b**6*c**2*g**6)) + (-B*a**
2*d**2*i**2 - 3*B*a*b*c*d*i**2 - 5*B*a*b*d**2*i**2*x - 6*B*b**2*c**2*i**2 -
 15*B*b**2*c*d*i**2*x - 10*B*b**2*d**2*i**2*x**2)*log(e*(a + b*x)/(c + d*x)
)/(30*a**5*b**3*g**6 + 150*a**4*b**4*g**6*x + 300*a**3*b**5*g**6*x**2 + 300
*a**2*b**6*g**6*x**3 + 150*a*b**7*g**6*x**4 + 30*b**8*g**6*x**5)
```

Giac [B] time = 1.41879, size = 1211, normalized size = 4.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="giac")
```

```
[Out] 1/30*B*d^5*log(b*x + a)/(b^6*c^3*g^6 - 3*a*b^5*c^2*d*g^6 + 3*a^2*b^4*c*d^2*
g^6 - a^3*b^3*d^3*g^6) - 1/30*B*d^5*log(d*x + c)/(b^6*c^3*g^6 - 3*a*b^5*c^2
*d*g^6 + 3*a^2*b^4*c*d^2*g^6 - a^3*b^3*d^3*g^6) + 1/30*(10*B*b^2*d^2*x^2 +
15*B*b^2*c*d*x + 5*B*a*b*d^2*x + 6*B*b^2*c^2 + 3*B*a*b*c*d + B*a^2*d^2)*log
((b*x + a)/(d*x + c))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 +
 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/1800*(60*B*b^4*d^4
*x^4 - 30*B*b^4*c*d^3*x^3 + 270*B*a*b^3*d^4*x^3 + 600*A*b^4*c^2*d^2*x^2 + 6
20*B*b^4*c^2*d^2*x^2 - 1200*A*a*b^3*c*d^3*x^2 - 1330*B*a*b^3*c*d^3*x^2 + 60
0*A*a^2*b^2*d^4*x^2 + 1070*B*a^2*b^2*d^4*x^2 + 900*A*b^4*c^3*d*x + 1035*B*b
^4*c^3*d*x - 1500*A*a*b^3*c^2*d^2*x - 1865*B*a*b^3*c^2*d^2*x + 300*A*a^2*b^
2*c*d^3*x + 535*B*a^2*b^2*c*d^3*x + 300*A*a^3*b*d^4*x + 535*B*a^3*b*d^4*x +
 360*A*b^4*c^4 + 432*B*b^4*c^4 - 540*A*a*b^3*c^3*d - 693*B*a*b^3*c^3*d + 60
*A*a^2*b^2*c^2*d^2 + 107*B*a^2*b^2*c^2*d^2 + 60*A*a^3*b*c*d^3 + 107*B*a^3*b
*c*d^3 + 60*A*a^4*d^4 + 107*B*a^4*d^4)/(b^10*c^2*g^6*x^5 - 2*a*b^9*c*d*g^6*
x^5 + a^2*b^8*d^2*g^6*x^5 + 5*a*b^9*c^2*g^6*x^4 - 10*a^2*b^8*c*d*g^6*x^4 +
5*a^3*b^7*d^2*g^6*x^4 + 10*a^2*b^8*c^2*g^6*x^3 - 20*a^3*b^7*c*d*g^6*x^3 + 1
0*a^4*b^6*d^2*g^6*x^3 + 10*a^3*b^7*c^2*g^6*x^2 - 20*a^4*b^6*c*d*g^6*x^2 + 1
0*a^5*b^5*d^2*g^6*x^2 + 5*a^4*b^6*c^2*g^6*x - 10*a^5*b^5*c*d*g^6*x + 5*a^6*
b^4*d^2*g^6*x + a^5*b^5*c^2*g^6 - 2*a^6*b^4*c*d*g^6 + a^7*b^3*d^2*g^6)
```

3.20 $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=457

$$-\frac{b^2g^3i^3(c+dx)^6(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^4}+\frac{b^3g^3i^3(c+dx)^7\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{7d^4}-\frac{g^3i^3(c+dx)^4(bc-ad)^3\left(B\log\right.}{4d^4}$$

```
[Out] (B*(b*c - a*d)^6*g^3*i^3*x)/(140*b^3*d^3) + (B*(b*c - a*d)^5*g^3*i^3*(c + d
*x)^2)/(280*b^2*d^4) + (B*(b*c - a*d)^4*g^3*i^3*(c + d*x)^3)/(420*b*d^4) -
(17*B*(b*c - a*d)^3*g^3*i^3*(c + d*x)^4)/(280*d^4) + (b*B*(b*c - a*d)^2*g^3
*i^3*(c + d*x)^5)/(14*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*(c + d*x)^6)/(42*d^
4) + (B*(b*c - a*d)^7*g^3*i^3*Log[(a + b*x)/(c + d*x)])/(140*b^4*d^4) - ((b
*c - a*d)^3*g^3*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*d^
4) + (3*b*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d
*x)]))/(5*d^4) - (b^2*(b*c - a*d)*g^3*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(2*d^4) + (b^3*g^3*i^3*(c + d*x)^7*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(7*d^4) + (B*(b*c - a*d)^7*g^3*i^3*Log[c + d*x])/(140*b^4*d^
4)
```

Rubi [A] time = 0.944784, antiderivative size = 416, normalized size of antiderivative = 0.91, number of steps used = 18, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 43}

$$\frac{d^2g^3i^3(a+bx)^6(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^4}+\frac{d^3g^3i^3(a+bx)^7\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{7b^4}+\frac{g^3i^3(a+bx)^4(bc-ad)^3\left(B\log\right.}{4b^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^6*g^3*i^3*x)/(140*b^3*d^3) + (B*(b*c - a*d)^5*g^3*i^3*(a +
b*x)^2)/(280*b^4*d^2) - (B*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3)/(420*b^4*d) -
 (17*B*(b*c - a*d)^3*g^3*i^3*(a + b*x)^4)/(280*b^4) - (B*d*(b*c - a*d)^2*g^
3*i^3*(a + b*x)^5)/(14*b^4) - (B*d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6)/(42*b
^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(4*b^4) + (3*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(5*b^4) + (d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(2*b^4) + (d^3*g^3*i^3*(a + b*x)^7*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(7*b^4) + (B*(b*c - a*d)^7*g^3*i^3*Log[c + d*x])/(1
40*b^4*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (20c+20dx)^3(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{(-bc+ad)^3g^3(20c+20dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^3}+\frac{3b(bc\right.$$

$$=\frac{\left(b^3g^3\right)\int(20c+20dx)^6\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{8000d^3}-\frac{\left(3b^2(bc-a\right.}{}$$

$$=-\frac{2000(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^4}+\frac{4800b(bc}{}$$

$$=-\frac{2000(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^4}+\frac{4800b(bc}{}$$

$$=-\frac{2000(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^4}+\frac{4800b(bc}{}$$

$$=\frac{400B(bc-ad)^6g^3x}{7b^3d^3}+\frac{200B(bc-ad)^5g^3(c+dx)^2}{7b^2d^4}+\frac{400B(bc-}{}$$

Mathematica [A] time = 0.590608, size = 586, normalized size = 1.28

$$\frac{g^3i^3\left(420d^2(a+bx)^6(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+120d^3(a+bx)^7\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+210(a+bx)^4(bc-ad)^3\left(B\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)]),x]
```

```
[Out] (g^3*i^3*((120*b^2*B*c*(b*c - a*d)^5*x)/d^3 - (126*b*B*(b*c - a*d)^6*x)/d^3
 + (120*a*b*B*(-(b*c) + a*d)^5*x)/d^2 - (60*b*B*c*(b*c - a*d)^4*(a + b*x)^2
)/d^2 + (60*a*B*(b*c - a*d)^4*(a + b*x)^2)/d + (63*B*(b*c - a*d)^5*(a + b*x
)^2)/d^2 + (40*b*B*c*(b*c - a*d)^3*(a + b*x)^3)/d - (42*B*(b*c - a*d)^4*(a
+ b*x)^3)/d + 40*a*B*(-(b*c) + a*d)^3*(a + b*x)^3 - 30*b*B*c*(b*c - a*d)^2*
(a + b*x)^4 + 30*a*B*d*(b*c - a*d)^2*(a + b*x)^4 + 21*B*(-(b*c) + a*d)^3*(a
 + b*x)^4 + 24*b*B*c*d*(b*c - a*d)*(a + b*x)^5 - 84*B*d*(b*c - a*d)^2*(a +
b*x)^5 + 24*a*B*d^2*(-(b*c) + a*d)*(a + b*x)^5 - 20*b*B*c*d^2*(a + b*x)^6 +
 20*a*B*d^3*(a + b*x)^6 + 210*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[(e*(a +
b*x))/(c + d*x)]) + 504*d*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]) + 420*d^2*(b*c - a*d)*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]) + 120*d^3*(a + b*x)^7*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (120
```

```
*b*B*c*(b*c - a*d)^6*Log[c + d*x])/d^4 + (120*a*B*(b*c - a*d)^6*Log[c + d*x
])/d^3 + (126*B*(b*c - a*d)^7*Log[c + d*x])/d^4))/(840*b^4)
```

Maple [B] time = 0.222, size = 11172, normalized size = 24.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.52151, size = 3560, normalized size = 7.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="maxima")
```

```
[Out] 1/7*A*b^3*d^3*g^3*i^3*x^7 + 1/2*A*b^3*c*d^2*g^3*i^3*x^6 + 1/2*A*a*b^2*d^3*g
^3*i^3*x^6 + 3/5*A*b^3*c^2*d*g^3*i^3*x^5 + 9/5*A*a*b^2*c*d^2*g^3*i^3*x^5 +
3/5*A*a^2*b*d^3*g^3*i^3*x^5 + 1/4*A*b^3*c^3*g^3*i^3*x^4 + 9/4*A*a*b^2*c^2*d
*g^3*i^3*x^4 + 9/4*A*a^2*b*c*d^2*g^3*i^3*x^4 + 1/4*A*a^3*d^3*g^3*i^3*x^4 +
A*a*b^2*c^3*g^3*i^3*x^3 + 3*A*a^2*b*c^2*d*g^3*i^3*x^3 + A*a^3*c*d^2*g^3*i^3
*x^3 + 3/2*A*a^2*b*c^3*g^3*i^3*x^2 + 3/2*A*a^3*c^2*d*g^3*i^3*x^2 + (x*log(b
*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^
3*c^3*g^3*i^3 + 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x
 + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^2*b*c^3*g^3*i^3
 + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3
 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2
)*x)/(b^2*d^2))*B*a*b^2*c^3*g^3*i^3 + 1/24*(6*x^4*log(b*e*x/(d*x + c) + a*e
/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d
^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)
*x)/(b^3*d^3))*B*b^3*c^3*g^3*i^3 + 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*
B*a^3*c^2*d*g^3*i^3 + 3/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^2*b*c^2*d*g^3*i^3 + 3/8*(6*x^4*log(b
*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x +
c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6
*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*b^2*c^2*d*g^3*i^3 + 1/20*(12*x^5*log
(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*
x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)
*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))
*B*b^3*c^2*d*g^3*i^3 + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*
a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 -
2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^3*c*d^2*g^3*i^3 + 3/8*(6*x^4*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c
)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*
(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a^2*b*c*d^2*g^3*i^3 + 3/20*(12*x^5*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x
```

```
 + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*
x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*
B*a*b^2*c*d^2*g^3*i^3 + 1/120*(60*x^6*log(b*e*x/(d*x + c) + a*e/(d*x + c))
- 60*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^
4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2
*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5
*d^5))*B*b^3*c*d^2*g^3*i^3 + 1/24*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c
)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^
2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*
d^3))*B*a^3*d^3*g^3*i^3 + 1/20*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^
3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*
x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*a^2*b*d^3*g^3*i^3 + 1/120*(60*
x^6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6
*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2
*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*
d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*B*a*b^2*d^3*g^3*i^3 + 1/420
*(60*x^7*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 60*a^7*log(b*x + a)/b^7 - 6
0*c^7*log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6)*x^6 - 12*(b^6*c^2*d^4
- a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*x^4 - 20*(b^6*c^4*d^2 -
 a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - 60*(b^6*c^6 - a^6*d^6)
*x)/(b^6*d^6))*B*b^3*d^3*g^3*i^3 + A*a^3*c^3*g^3*i^3*x
```

Fricas [B] time = 1.79378, size = 1894, normalized size = 4.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="fricas")
```

```
[Out] 1/840*(120*A*b^7*d^7*g^3*i^3*x^7 + 20*((21*A - B)*b^7*c*d^6 + (21*A + B)*a*
b^6*d^7)*g^3*i^3*x^6 + 12*((42*A - 5*B)*b^7*c^2*d^5 + 126*A*a*b^6*c*d^6 + (
42*A + 5*B)*a^2*b^5*d^7)*g^3*i^3*x^5 + 3*((70*A - 17*B)*b^7*c^3*d^4 + 7*(90
*A - 7*B)*a*b^6*c^2*d^5 + 7*(90*A + 7*B)*a^2*b^5*c*d^6 + (70*A + 17*B)*a^3*
b^4*d^7)*g^3*i^3*x^4 - 2*(B*b^7*c^4*d^3 - 14*(30*A - 7*B)*a*b^6*c^3*d^4 - 1
260*A*a^2*b^5*c^2*d^5 - 14*(30*A + 7*B)*a^3*b^4*c*d^6 - B*a^4*b^3*d^7)*g^3*
i^3*x^3 + 3*(B*b^7*c^5*d^2 - 7*B*a*b^6*c^4*d^3 + 84*(5*A - B)*a^2*b^5*c^3*d
^4 + 84*(5*A + B)*a^3*b^4*c^2*d^5 + 7*B*a^4*b^3*c*d^6 - B*a^5*b^2*d^7)*g^3*
i^3*x^2 - 6*(B*b^7*c^6*d - 7*B*a*b^6*c^5*d^2 + 21*B*a^2*b^5*c^4*d^3 - 140*A
*a^3*b^4*c^3*d^4 - 21*B*a^4*b^3*c^2*d^5 + 7*B*a^5*b^2*c*d^6 - B*a^6*b*d^7)*
g^3*i^3*x + 6*(35*B*a^4*b^3*c^3*d^4 - 21*B*a^5*b^2*c^2*d^5 + 7*B*a^6*b*c*d^
6 - B*a^7*d^7)*g^3*i^3*log(b*x + a) + 6*(B*b^7*c^7 - 7*B*a*b^6*c^6*d + 21*B
*a^2*b^5*c^5*d^2 - 35*B*a^3*b^4*c^4*d^3)*g^3*i^3*log(d*x + c) + 6*(20*B*b^7
*d^7*g^3*i^3*x^7 + 140*B*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(B*b^7*c*d^6 + B*a*
b^6*d^7)*g^3*i^3*x^6 + 84*(B*b^7*c^2*d^5 + 3*B*a*b^6*c*d^6 + B*a^2*b^5*d^7)
*g^3*i^3*x^5 + 35*(B*b^7*c^3*d^4 + 9*B*a*b^6*c^2*d^5 + 9*B*a^2*b^5*c*d^6 +
B*a^3*b^4*d^7)*g^3*i^3*x^4 + 140*(B*a*b^6*c^3*d^4 + 3*B*a^2*b^5*c^2*d^5 + B
*a^3*b^4*c*d^6)*g^3*i^3*x^3 + 210*(B*a^2*b^5*c^3*d^4 + B*a^3*b^4*c^2*d^5)*g
^3*i^3*x^2)*log((b*e*x + a*e)/(d*x + c)))/(b^4*d^4)
```

Sympy [B] time = 20.5444, size = 2188, normalized size = 4.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**3*d**3*g**3*i**3*x**7/7 - B*a**4*g**3*i**3*(a**3*d**3 - 7*a**2*b*c*d**
2 + 21*a*b**2*c**2*d - 35*b**3*c**3)*log(x + (B*a**7*c*d**6*g**3*i**3 - 7*B
*a**6*b*c**2*d**5*g**3*i**3 + 21*B*a**5*b**2*c**3*d**4*g**3*i**3 + B*a**5*d
**4*g**3*i**3*(a**3*d**3 - 7*a**2*b*c*d**2 + 21*a*b**2*c**2*d - 35*b**3*c**
3)/b - 70*B*a**4*b**3*c**4*d**3*g**3*i**3 - B*a**4*c*d**3*g**3*i**3*(a**3*d
**3 - 7*a**2*b*c*d**2 + 21*a*b**2*c**2*d - 35*b**3*c**3) + 21*B*a**3*b**4*c
**5*d**2*g**3*i**3 - 7*B*a**2*b**5*c**6*d*g**3*i**3 + B*a*b**6*c**7*g**3*i*
*3)/(B*a**7*d**7*g**3*i**3 - 7*B*a**6*b*c*d**6*g**3*i**3 + 21*B*a**5*b**2*c
**2*d**5*g**3*i**3 - 35*B*a**4*b**3*c**3*d**4*g**3*i**3 - 35*B*a**3*b**4*c*
*4*d**3*g**3*i**3 + 21*B*a**2*b**5*c**5*d**2*g**3*i**3 - 7*B*a*b**6*c**6*d*
g**3*i**3 + B*b**7*c**7*g**3*i**3))/(140*b**4) - B*c**4*g**3*i**3*(35*a**3*
d**3 - 21*a**2*b*c*d**2 + 7*a*b**2*c**2*d - b**3*c**3)*log(x + (B*a**7*c*d*
*6*g**3*i**3 - 7*B*a**6*b*c**2*d**5*g**3*i**3 + 21*B*a**5*b**2*c**3*d**4*g*
*3*i**3 - 70*B*a**4*b**3*c**4*d**3*g**3*i**3 + 21*B*a**3*b**4*c**5*d**2*g**
3*i**3 - 7*B*a**2*b**5*c**6*d*g**3*i**3 + B*a*b**6*c**7*g**3*i**3 + B*a*b**
3*c**4*g**3*i**3*(35*a**3*d**3 - 21*a**2*b*c*d**2 + 7*a*b**2*c**2*d - b**3*
c**3) - B*b**4*c**5*g**3*i**3*(35*a**3*d**3 - 21*a**2*b*c*d**2 + 7*a*b**2*c
**2*d - b**3*c**3)/d)/(B*a**7*d**7*g**3*i**3 - 7*B*a**6*b*c*d**6*g**3*i**3
+ 21*B*a**5*b**2*c**2*d**5*g**3*i**3 - 35*B*a**4*b**3*c**3*d**4*g**3*i**3 -
 35*B*a**3*b**4*c**4*d**3*g**3*i**3 + 21*B*a**2*b**5*c**5*d**2*g**3*i**3 -
7*B*a*b**6*c**6*d*g**3*i**3 + B*b**7*c**7*g**3*i**3))/(140*d**4) + x**6*(A*
a*b**2*d**3*g**3*i**3/2 + A*b**3*c*d**2*g**3*i**3/2 + B*a*b**2*d**3*g**3*i*
*3/42 - B*b**3*c*d**2*g**3*i**3/42) + x**5*(3*A*a**2*b*d**3*g**3*i**3/5 + 9
*A*a*b**2*c*d**2*g**3*i**3/5 + 3*A*b**3*c**2*d*g**3*i**3/5 + B*a**2*b*d**3*
g**3*i**3/14 - B*b**3*c**2*d*g**3*i**3/14) + x**4*(A*a**3*d**3*g**3*i**3/4
+ 9*A*a**2*b*c*d**2*g**3*i**3/4 + 9*A*a*b**2*c**2*d*g**3*i**3/4 + A*b**3*c*
*3*g**3*i**3/4 + 17*B*a**3*d**3*g**3*i**3/280 + 7*B*a**2*b*c*d**2*g**3*i**3
/40 - 7*B*a*b**2*c**2*d*g**3*i**3/40 - 17*B*b**3*c**3*g**3*i**3/280) + (B*a
**3*c**3*g**3*i**3*x + 3*B*a**3*c**2*d*g**3*i**3*x**2/2 + B*a**3*c*d**2*g**
3*i**3*x**3 + B*a**3*d**3*g**3*i**3*x**4/4 + 3*B*a**2*b*c**3*g**3*i**3*x**2
/2 + 3*B*a**2*b*c**2*d*g**3*i**3*x**3 + 9*B*a**2*b*c*d**2*g**3*i**3*x**4/4
+ 3*B*a**2*b*d**3*g**3*i**3*x**5/5 + B*a*b**2*c**3*g**3*i**3*x**3 + 9*B*a*b
**2*c**2*d*g**3*i**3*x**4/4 + 9*B*a*b**2*c*d**2*g**3*i**3*x**5/5 + B*a*b**2
*d**3*g**3*i**3*x**6/2 + B*b**3*c**3*g**3*i**3*x**4/4 + 3*B*b**3*c**2*d*g**
3*i**3*x**5/5 + B*b**3*c*d**2*g**3*i**3*x**6/2 + B*b**3*d**3*g**3*i**3*x**7
/7)*log(e*(a + b*x)/(c + d*x)) + x**3*(420*A*a**3*b*c*d**3*g**3*i**3 + 1260
*A*a**2*b**2*c**2*d**2*g**3*i**3 + 420*A*a*b**3*c**3*d*g**3*i**3 + B*a**4*d
**4*g**3*i**3 + 98*B*a**3*b*c*d**3*g**3*i**3 - 98*B*a*b**3*c**3*d*g**3*i**3
 - B*b**4*c**4*g**3*i**3)/(420*b*d) - x**2*(-420*A*a**3*b**2*c**2*d**3*g**3
*i**3 - 420*A*a**2*b**3*c**3*d**2*g**3*i**3 + B*a**5*d**5*g**3*i**3 - 7*B*a
**4*b*c*d**4*g**3*i**3 - 84*B*a**3*b**2*c**2*d**3*g**3*i**3 + 84*B*a**2*b**
3*c**3*d**2*g**3*i**3 + 7*B*a*b**4*c**4*d*g**3*i**3 - B*b**5*c**5*g**3*i**3
)/(280*b**2*d**2) + x*(140*A*a**3*b**3*c**3*d**3*g**3*i**3 + B*a**6*d**6*g*
*3*i**3 - 7*B*a**5*b*c*d**5*g**3*i**3 + 21*B*a**4*b**2*c**2*d**4*g**3*i**3
- 21*B*a**2*b**4*c**4*d**2*g**3*i**3 + 7*B*a*b**5*c**5*d*g**3*i**3 - B*b**6
*c**6*g**3*i**3)/(140*b**3*d**3)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
```

```
ithm="giac")
```

```
[Out] Timed out
```

3.21 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=371

$$\frac{b^2g^2i^3(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6d^3}+\frac{g^2i^3(c+dx)^4(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^3}-\frac{2bg^2i^3(c+dx)^5(bc-ad)\left(B\log\right.}{5d^3}$$

```
[Out] -(B*(b*c - a*d)^5*g^2*i^3*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*(c + d
*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(180*b*d^3) +
(7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d)*g^2*i^
3*(c + d*x)^5)/(30*d^3) - (B*(b*c - a*d)^6*g^2*i^3*Log[(a + b*x)/(c + d*x)]
)/(60*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(6*d^3) - (B*(b*c - a*d)^6*g^2*i^3*Log[c + d*x])/(60
*b^4*d^3)
```

Rubi [A] time = 0.674729, antiderivative size = 330, normalized size of antiderivative = 0.89, number of steps used = 14, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 43}

$$\frac{b^2g^2i^3(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6d^3}+\frac{g^2i^3(c+dx)^4(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^3}-\frac{2bg^2i^3(c+dx)^5(bc-ad)\left(B\log\right.}{5d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^5*g^2*i^3*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*(c + d
*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(180*b*d^3) +
(7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d)*g^2*i^
3*(c + d*x)^5)/(30*d^3) - (B*(b*c - a*d)^6*g^2*i^3*Log[a + b*x])/(60*b^4*d^
3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(6*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (21c+21dx)^3(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{(-bc+ad)^2g^2(21c+21dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}-\frac{2b(bc}{}\right.$$

$$=\frac{\left(b^2g^2\right)\int(21c+21dx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{441d^2}-\frac{\left(2b(bc-ad\right.}{}$$

$$=\frac{9261(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d^3}-\frac{18522b(bc}{}$$

$$=\frac{9261(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d^3}-\frac{18522b(bc}{}$$

$$=\frac{9261(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d^3}-\frac{18522b(bc}{}$$

$$=-\frac{3087B(bc-ad)^5g^2x}{20b^3d^2}-\frac{3087B(bc-ad)^4g^2(c+dx)^2}{40b^2d^3}-\frac{1029B}{}$$

Mathematica [A] time = 0.320609, size = 429, normalized size = 1.16

$$\frac{g^2i^3\left(60b^6(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-144b^5(c+dx)^5(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+90b^4(c+dx)^4(bc-ad)^2\left(B\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)]),x]
```

```
[Out] (g^2*i^3*(-15*B*(b*c - a*d)^3*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c
 + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 12*B*(b*c -
 a*d)^2*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b^3*(
b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b*x])
 - B*(b*c - a*d)*(60*b*d*(b*c - a*d)^4*x + 30*b^2*(b*c - a*d)^3*(c + d*x)^2
 + 20*b^3*(b*c - a*d)^2*(c + d*x)^3 + 15*b^4*(b*c - a*d)*(c + d*x)^4 + 12*b
^5*(c + d*x)^5 + 60*(b*c - a*d)^5*Log[a + b*x]) + 90*b^4*(b*c - a*d)^2*(c +
 d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 144*b^5*(b*c - a*d)*(c + d*x
)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 60*b^6*(c + d*x)^6*(A + B*Log[(e
*(a + b*x))/(c + d*x)])))/(360*b^4*d^3)
```

Maple [B] time = 0.211, size = 7597, normalized size = 20.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.49185, size = 2415, normalized size = 6.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="maxima")
```

```
[Out] 1/6*A*b^2*d^3*g^2*i^3*x^6 + 3/5*A*b^2*c*d^2*g^2*i^3*x^5 + 2/5*A*a*b*d^3*g^2
*i^3*x^5 + 3/4*A*b^2*c^2*d*g^2*i^3*x^4 + 3/2*A*a*b*c*d^2*g^2*i^3*x^4 + 1/4*
A*a^2*d^3*g^2*i^3*x^4 + 1/3*A*b^2*c^3*g^2*i^3*x^3 + 2*A*a*b*c^2*d*g^2*i^3*x
^3 + A*a^2*c*d^2*g^2*i^3*x^3 + A*a*b*c^3*g^2*i^3*x^2 + 3/2*A*a^2*c^2*d*g^2*
i^3*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*lo
g(d*x + c)/d)*B*a^2*c^3*g^2*i^3 + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a*b
*c^3*g^2*i^3 + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(
b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c
^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*c^3*g^2*i^3 + 3/2*(x^2*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a
*d)*x/(b*d))*B*a^2*c^2*d*g^2*i^3 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x +
c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2
)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b*c^2*d*g^2*i^3 + 1/8*(6*x^
4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log
(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*
x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^2*c^2*d*g^2*i^3 + 1/2*(2*x^3*
log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d
*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)
)*B*a^2*c*d^2*g^2*i^3 + 1/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6
*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*
B*a*b*c*d^2*g^2*i^3 + 1/20*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1
2*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^
4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2
- 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^2*c*d^2*g^2*i^3 + 1/24*(6*x^4*lo
g(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x
 + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2
+ 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a^2*d^3*g^2*i^3 + 1/30*(12*x^5*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x
 + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*
x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*
B*a*b*d^3*g^2*i^3 + 1/360*(60*x^6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60
*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^
5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5
)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5
))*B*b^2*d^3*g^2*i^3 + A*a^2*c^3*g^2*i^3*x
```

Fricas [B] time = 1.50269, size = 1509, normalized size = 4.07

$$60\,Ab^{6}d^{6}g^{2}i^{3}x^{6} + 12\left((18\,A - B)b^{6}cd^{5} + (12\,A + B)ab^{5}d^{6}\right)g^{2}i^{3}x^{5} + 3\left((90\,A - 13\,B)b^{6}c^{2}d^{4} + 6\,(30\,A + B)ab^{5}cd^{5} + (30\,A\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="fricas")
```

```
[Out] 1/360*(60*A*b^6*d^6*g^2*i^3*x^6 + 12*((18*A - B)*b^6*c*d^5 + (12*A + B)*a*b
^5*d^6)*g^2*i^3*x^5 + 3*((90*A - 13*B)*b^6*c^2*d^4 + 6*(30*A + B)*a*b^5*c*d
^5 + (30*A + 7*B)*a^2*b^4*d^6)*g^2*i^3*x^4 + 2*((60*A - 19*B)*b^6*c^3*d^3 +
 3*(120*A - 7*B)*a*b^5*c^2*d^4 + 3*(60*A + 13*B)*a^2*b^4*c*d^5 + B*a^3*b^3*
d^6)*g^2*i^3*x^3 - 3*(B*b^6*c^4*d^2 - 2*(60*A - 17*B)*a*b^5*c^3*d^3 - 30*(6
*A + B)*a^2*b^4*c^2*d^4 - 6*B*a^3*b^3*c*d^5 + B*a^4*b^2*d^6)*g^2*i^3*x^2 +
6*(B*b^6*c^5*d - 6*B*a*b^5*c^4*d^2 + 5*(12*A - B)*a^2*b^4*c^3*d^3 + 15*B*a^
3*b^3*c^2*d^4 - 6*B*a^4*b^2*c*d^5 + B*a^5*b*d^6)*g^2*i^3*x + 6*(20*B*a^3*b^
3*c^3*d^3 - 15*B*a^4*b^2*c^2*d^4 + 6*B*a^5*b*c*d^5 - B*a^6*d^6)*g^2*i^3*log
(b*x + a) - 6*(B*b^6*c^6 - 6*B*a*b^5*c^5*d + 15*B*a^2*b^4*c^4*d^2)*g^2*i^3*
log(d*x + c) + 6*(10*B*b^6*d^6*g^2*i^3*x^6 + 60*B*a^2*b^4*c^3*d^3*g^2*i^3*x
 + 12*(3*B*b^6*c*d^5 + 2*B*a*b^5*d^6)*g^2*i^3*x^5 + 15*(3*B*b^6*c^2*d^4 + 6
*B*a*b^5*c*d^5 + B*a^2*b^4*d^6)*g^2*i^3*x^4 + 20*(B*b^6*c^3*d^3 + 6*B*a*b^5
*c^2*d^4 + 3*B*a^2*b^4*c*d^5)*g^2*i^3*x^3 + 30*(2*B*a*b^5*c^3*d^3 + 3*B*a^2
*b^4*c^2*d^4)*g^2*i^3*x^2)*log((b*e*x + a*e)/(d*x + c)))/(b^4*d^3)
```

Sympy [B] time = 13.9354, size = 1761, normalized size = 4.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**2*d**3*g**2*i**3*x**6/6 - B*a**3*g**2*i**3*(a**3*d**3 - 6*a**2*b*c*d**
2 + 15*a*b**2*c**2*d - 20*b**3*c**3)*log(x + (B*a**6*c*d**5*g**2*i**3 - 6*B
*a**5*b*c**2*d**4*g**2*i**3 + 15*B*a**4*b**2*c**3*d**3*g**2*i**3 + B*a**4*d
**3*g**2*i**3*(a**3*d**3 - 6*a**2*b*c*d**2 + 15*a*b**2*c**2*d - 20*b**3*c**
3)/b - 35*B*a**3*b**3*c**4*d**2*g**2*i**3 - B*a**3*c*d**2*g**2*i**3*(a**3*d
**3 - 6*a**2*b*c*d**2 + 15*a*b**2*c**2*d - 20*b**3*c**3) + 6*B*a**2*b**4*c*
*5*d*g**2*i**3 - B*a*b**5*c**6*g**2*i**3)/(B*a**6*d**6*g**2*i**3 - 6*B*a**5
*b*c*d**5*g**2*i**3 + 15*B*a**4*b**2*c**2*d**4*g**2*i**3 - 20*B*a**3*b**3*c
**3*d**3*g**2*i**3 - 15*B*a**2*b**4*c**4*d**2*g**2*i**3 + 6*B*a*b**5*c**5*d
*g**2*i**3 - B*b**6*c**6*g**2*i**3))/(60*b**4) - B*c**4*g**2*i**3*(15*a**2*
d**2 - 6*a*b*c*d + b**2*c**2)*log(x + (B*a**6*c*d**5*g**2*i**3 - 6*B*a**5*b
*c**2*d**4*g**2*i**3 + 15*B*a**4*b**2*c**3*d**3*g**2*i**3 - 35*B*a**3*b**3*
c**4*d**2*g**2*i**3 + 6*B*a**2*b**4*c**5*d*g**2*i**3 - B*a*b**5*c**6*g**2*i
**3 + B*a*b**3*c**4*g**2*i**3*(15*a**2*d**2 - 6*a*b*c*d + b**2*c**2) - B*b*
*4*c**5*g**2*i**3*(15*a**2*d**2 - 6*a*b*c*d + b**2*c**2)/d)/(B*a**6*d**6*g*
*2*i**3 - 6*B*a**5*b*c*d**5*g**2*i**3 + 15*B*a**4*b**2*c**2*d**4*g**2*i**3
- 20*B*a**3*b**3*c**3*d**3*g**2*i**3 - 15*B*a**2*b**4*c**4*d**2*g**2*i**3 +
 6*B*a*b**5*c**5*d*g**2*i**3 - B*b**6*c**6*g**2*i**3))/(60*d**3) + x**5*(2*
A*a*b*d**3*g**2*i**3/5 + 3*A*b**2*c*d**2*g**2*i**3/5 + B*a*b*d**3*g**2*i**3
/30 - B*b**2*c*d**2*g**2*i**3/30) + x**4*(A*a**2*d**3*g**2*i**3/4 + 3*A*a*b
*c*d**2*g**2*i**3/2 + 3*A*b**2*c**2*d*g**2*i**3/4 + 7*B*a**2*d**3*g**2*i**3
/120 + B*a*b*c*d**2*g**2*i**3/20 - 13*B*b**2*c**2*d*g**2*i**3/120) + (B*a**
```

```
2*c**3*g**2*i**3*x + 3*B*a**2*c**2*d*g**2*i**3*x**2/2 + B*a**2*c*d**2*g**2*
i**3*x**3 + B*a**2*d**3*g**2*i**3*x**4/4 + B*a*b*c**3*g**2*i**3*x**2 + 2*B*
a*b*c**2*d*g**2*i**3*x**3 + 3*B*a*b*c*d**2*g**2*i**3*x**4/2 + 2*B*a*b*d**3*
g**2*i**3*x**5/5 + B*b**2*c**3*g**2*i**3*x**3/3 + 3*B*b**2*c**2*d*g**2*i**3
*x**4/4 + 3*B*b**2*c*d**2*g**2*i**3*x**5/5 + B*b**2*d**3*g**2*i**3*x**6/6)*
log(e*(a + b*x)/(c + d*x)) + x**3*(180*A*a**2*b*c*d**2*g**2*i**3 + 360*A*a*
b**2*c**2*d*g**2*i**3 + 60*A*b**3*c**3*g**2*i**3 + B*a**3*d**3*g**2*i**3 +
39*B*a**2*b*c*d**2*g**2*i**3 - 21*B*a*b**2*c**2*d*g**2*i**3 - 19*B*b**3*c**
3*g**2*i**3)/(180*b) - x**2*(-180*A*a**2*b**2*c**2*d**2*g**2*i**3 - 120*A*a
*b**3*c**3*d*g**2*i**3 + B*a**4*d**4*g**2*i**3 - 6*B*a**3*b*c*d**3*g**2*i**
3 - 30*B*a**2*b**2*c**2*d**2*g**2*i**3 + 34*B*a*b**3*c**3*d*g**2*i**3 + B*b
**4*c**4*g**2*i**3)/(120*b**2*d) + x*(60*A*a**2*b**3*c**3*d**2*g**2*i**3 +
B*a**5*d**5*g**2*i**3 - 6*B*a**4*b*c*d**4*g**2*i**3 + 15*B*a**3*b**2*c**2*d
**3*g**2*i**3 - 5*B*a**2*b**3*c**3*d**2*g**2*i**3 - 6*B*a*b**4*c**4*d*g**2*
i**3 + B*b**5*c**5*g**2*i**3)/(60*b**3*d**2)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="giac")
```

```
[Out] Timed out
```

3.22 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=271

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2}+\frac{bgi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^2}+\frac{Bgi^3(c+dx)^2(bc-ad)^3}{40b^2d^2}+\frac{Bgi^3(bc-$$

```
[Out] (B*(b*c - a*d)^4*g*i^3*x)/(20*b^3*d) + (B*(b*c - a*d)^3*g*i^3*(c + d*x)^2)/
(40*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*(c + d*x)^3)/(60*b*d^2) - (B*(b*c - a
*d)*g*i^3*(c + d*x)^4)/(20*d^2) + (B*(b*c - a*d)^5*g*i^3*Log[(a + b*x)/(c +
 d*x)])/(20*b^4*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(5*d^2) + (B*(b*c - a*d)^5*g*i^3*Log[c + d*x])/(20*b^4*d^2)
```

Rubi [A] time = 0.340664, antiderivative size = 232, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 43}

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2}+\frac{bgi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^2}+\frac{Bgi^3(c+dx)^2(bc-ad)^3}{40b^2d^2}+\frac{Bgi^3(bc-$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^4*g*i^3*x)/(20*b^3*d) + (B*(b*c - a*d)^3*g*i^3*(c + d*x)^2)/
(40*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*(c + d*x)^3)/(60*b*d^2) - (B*(b*c - a
*d)*g*i^3*(c + d*x)^4)/(20*d^2) + (B*(b*c - a*d)^5*g*i^3*Log[a + b*x])/(20*
b^4*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
5*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (22c+22dx)^3(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \int\left(\frac{(-bc+ad)g(22c+22dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d}+\frac{bg(22\right.$$

$$=\frac{(bg)\int(22c+22dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{22d}+\frac{((-bc+ad)}{}$$

$$=-\frac{2662(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}+\frac{10648bg(}{}$$

$$=-\frac{2662(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}+\frac{10648bg(}{}$$

$$=-\frac{2662(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2}+\frac{10648bg(}{}$$

$$=\frac{2662B(bc-ad)^4gx}{5b^3d}+\frac{1331B(bc-ad)^3g(c+dx)^2}{5b^2d^2}+\frac{2662B(}{}$$

Mathematica [A] time = 0.192793, size = 261, normalized size = 0.96

$$\frac{gi^3\left(24b(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-30(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{5B(bc-ad)^2\left(3b^2(c+dx)^2(bc-ad)+6bdx(bc-}{b^4}\right.}{120d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
),x]
```

```
[Out] (g*i^3*((5*B*(b*c - a*d)^2*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c +
d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/b^4 - (2*B*(b*c
 - a*d)*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b^3*(
b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b*x])
)/b^4 - 30*(b*c - a*d)*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2
4*b*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(120*d^2)
```

Maple [B] time = 0.191, size = 4481, normalized size = 16.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] -1/4*e^2*d*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*c^2-1/20*e/d^2*B*g*i
^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^5-1/12*e^3*d^2*B*g*i^3/(d*e/(d*x+c)*
```

```
a-e/(d*x+c)*b*c)^3*a^4*c-1/60*e^3/d^2*B*g*i^3*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)^3*c^5+1/40*e^2/d^2*B*g*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^5-1/2
0*e^4/d^2*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*b^5*c^5+1/20*e*d^3*B*g*i^
3/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^5-1/5*e^5/d^2*A*g*i^3*b^6/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^5*c^5-1/40*e^2*d^3*B*g*i^3/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)^2*a^5+1/5*e^5*d^3*A*g*i^3*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^5+1/60*e
^3*d^3*B*g*i^3/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5+1/4*e^2*B*g*i^3/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c^3*b-2*e^5*A*g*i^3*b^4/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^5*a^2*c^3-1/2*e^4*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^3*
c^3-5/2*e^4*A*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^3*c^3-1/6*e^3*B*g
*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c^3-1/4*e^4/d^2*A*g*i^3/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^4*b^5*c^5+1/4*e^4*d^3*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^5-1/4*d^2*B*g*i^3/b^3*ln(d*(b*
e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^4*c+1/2*d*B*g*i^3/b^2*ln(d*(b*e/d+(a*d-b*
c)*e/d/(d*x+c))-b*e)*a^3*c^2-1/2*e*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^
2*c^3-e^5*d^2*B*g*i^3*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^5*a^4*c+1/5*e^5*d^8*B*g*i^3/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^10/(d*x+c)^5+5/4*e^4/d*B*g*i^3*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^4*b^4*a-5/4*e^4*d
^2*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*
a^4*b*c-1/4*e^4*d^7*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^4/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^4*a^9/(d*x+c)^4+5/2*e^4*d*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c^2+2*e^5*d*B*g*i^3*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^3*b^3*c^2+42*e
^5*d^4*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^5*c^4/(d*x+c)^5*a^6-1/20/d^2*B*g*i^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b
*e)*c^5*b+1/20*d^3*B*g*i^3/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^5-
1/2*B*g*i^3/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c^3+1/20*e^4*d^3*
B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^5+1/4*e^4*d^3*A*g*i^3/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^4*a^5+1/4/d*B*g*i^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b
*e)*c^4*a+1/4*e^4/d^2*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)^4*c^9/(d*x+c)^4*b^5-63/2*e^4*d^3*B*g*i^3*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^5*c^4/(d*x+c)^4+1/5*e^5/d^
2*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c
^10/(d*x+c)^5*b^6+9*e^5*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^5*c^8/(d*x+c)^5*a^2*b^4+9*e^4*B*g*i^3*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*c^7/(d*x+c)^4+e^5/d*B
*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c^4*
b^5*a-2*e^5*d^7*B*g*i^3/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)^5*a^9/(d*x+c)^5*c+9/4*e^4*d^6*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^8/(d*x+c)^4*c-252/5*e^5*d^3
*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c^
5/(d*x+c)^5*a^5*b+42*e^5*d^2*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^5*c^6/(d*x+c)^5*a^4*b^2-24*e^5*d*B*g*i^3*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c^7/(d*x+c)^5*a^3*b^3
-9/4*e^4/d*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^4*c^8/(d*x+c)^4*b^4*a-2*e^5/d*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c^9/(d*x+c)^5*b^5*a+9*e^5*d^6*B*g*i^3/b^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^8*c^2/(d*
x+c)^5-24*e^5*d^5*B*g*i^3/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)^5*a^7*c^3/(d*x+c)^5-9*e^4*d^5*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^7*c^2/(d*x+c)^4+21*e^4*d^4*
B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a
^6*c^3/(d*x+c)^4-21*e^4*d*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c^6/(d*x+c)^4+63/2*e^4*d^2*B*g*i^3*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4*c^5/(d*x+c)^4*b+
1/2*e*d*B*g*i^3/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3*c^2+1/4*e/d*B*g*i^3*b/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^4*a-1/4*e^4*d^2*B*g*i^3/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^4*a^4*b*c-5/4*e^4*d^2*A*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4
```

```
*b*c+1/12*e^3/d*B*g*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4*a-1/8*e^2/d
*B*g*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4*a+1/4*e^4/d*B*g*i^3/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^4*b^4*c^4*a-1/4*e^4/d^2*B*g*i^3*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^5*b^5-1/5*e^5/d^2*B*g*i^3*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c^5*b^6-5/2*e
^4*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^4*a^2*c^3-2*e^5*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^5*a^2*b^4*c^3+1/5*e^5*d^3*B*g*i^3*b*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^5+1/8*e^2*d^2*B*g*i^3/b/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^2*a^4*c+1/6*e^3*d*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^
3*a^3*c^2*b+2*e^5*d*A*g*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^3*c^2+1/2
*e^4*d*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b^2*c^2+5/2*e^4*d*A*g*i^
3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b^2*c^2-e^5*d^2*A*g*i^3*b^2/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^5*a^4*c+e^5/d*A*g*i^3*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^5*c^4*a+5/4*e^4/d*A*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*b^4*c^4*a-1/4*e
*d^2*B*g*i^3/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4*c
```

Maxima [B] time = 1.36154, size = 1380, normalized size = 5.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="maxima")
```

```
[Out] 1/5*A*b*d^3*g*i^3*x^5 + 3/4*A*b*c*d^2*g*i^3*x^4 + 1/4*A*a*d^3*g*i^3*x^4 + A
*b*c^2*d*g*i^3*x^3 + A*a*c*d^2*g*i^3*x^3 + 1/2*A*b*c^3*g*i^3*x^2 + 3/2*A*a*
c^2*d*g*i^3*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/
b - c*log(d*x + c)/d)*B*a*c^3*g*i^3 + 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d
*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d
))*B*b*c^3*g*i^3 + 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(
b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a*c^2*d*g*i^3
+ 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3
- 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)
*x)/(b^2*d^2))*B*b*c^2*d*g*i^3 + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d
^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*c*d^2*g*i^3 + 1/8*(6*x^4*
log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d
*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^
2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b*c*d^2*g*i^3 + 1/24*(6*x^4*log(b
*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x +
c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6
*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*d^3*g*i^3 + 1/60*(12*x^5*log(b*e*x/(
d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d
^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6
*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b*d^3
*g*i^3 + A*a*c^3*g*i^3*x
```

Fricas [A] time = 1.21094, size = 1057, normalized size = 3.9

$$24\,Ab^5d^5gi^3x^5 + 6\left((15\,A - B)b^5cd^4 + (5\,A + B)ab^4d^5\right)gi^3x^4 + 2\left((60\,A - 11\,B)b^5c^2d^3 + 10\,(6\,A + B)ab^4cd^4 + Ba^2b^3d^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="fricas")
```

```
[Out] 1/120*(24*A*b^5*d^5*g*i^3*x^5 + 6*((15*A - B)*b^5*c*d^4 + (5*A + B)*a*b^4*d
^5)*g*i^3*x^4 + 2*((60*A - 11*B)*b^5*c^2*d^3 + 10*(6*A + B)*a*b^4*c*d^4 + B
*a^2*b^3*d^5)*g*i^3*x^3 + 3*((20*A - 9*B)*b^5*c^3*d^2 + 5*(12*A + B)*a*b^4*
c^2*d^3 + 5*B*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*g*i^3*x^2 - 6*(B*b^5*c^4*d - 5
*(4*A - B)*a*b^4*c^3*d^2 - 10*B*a^2*b^3*c^2*d^3 + 5*B*a^3*b^2*c*d^4 - B*a^4
*b*d^5)*g*i^3*x + 6*(10*B*a^2*b^3*c^3*d^2 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*
b*c*d^4 - B*a^5*d^5)*g*i^3*log(b*x + a) + 6*(B*b^5*c^5 - 5*B*a*b^4*c^4*d)*g
*i^3*log(d*x + c) + 6*(4*B*b^5*d^5*g*i^3*x^5 + 20*B*a*b^4*c^3*d^2*g*i^3*x +
 5*(3*B*b^5*c*d^4 + B*a*b^4*d^5)*g*i^3*x^4 + 20*(B*b^5*c^2*d^3 + B*a*b^4*c*
d^4)*g*i^3*x^3 + 10*(B*b^5*c^3*d^2 + 3*B*a*b^4*c^2*d^3)*g*i^3*x^2)*log((b*e
*x + a*e)/(d*x + c)))/(b^4*d^2)
```

Sympy [B] time = 9.48581, size = 1187, normalized size = 4.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b*d**3*g*i**3*x**5/5 - B*a**2*g*i**3*(a**3*d**3 - 5*a**2*b*c*d**2 + 10*a*
b**2*c**2*d - 10*b**3*c**3)*log(x + (B*a**5*c*d**4*g*i**3 - 5*B*a**4*b*c**2
*d**3*g*i**3 + 10*B*a**3*b**2*c**3*d**2*g*i**3 + B*a**3*d**2*g*i**3*(a**3*d
**3 - 5*a**2*b*c*d**2 + 10*a*b**2*c**2*d - 10*b**3*c**3)/b - 15*B*a**2*b**3
*c**4*d*g*i**3 - B*a**2*c*d*g*i**3*(a**3*d**3 - 5*a**2*b*c*d**2 + 10*a*b**2
*c**2*d - 10*b**3*c**3) + B*a*b**4*c**5*g*i**3)/(B*a**5*d**5*g*i**3 - 5*B*a
**4*b*c*d**4*g*i**3 + 10*B*a**3*b**2*c**2*d**3*g*i**3 - 10*B*a**2*b**3*c**3
*d**2*g*i**3 - 5*B*a*b**4*c**4*d*g*i**3 + B*b**5*c**5*g*i**3))/(20*b**4) -
B*c**4*g*i**3*(5*a*d - b*c)*log(x + (B*a**5*c*d**4*g*i**3 - 5*B*a**4*b*c**2
*d**3*g*i**3 + 10*B*a**3*b**2*c**3*d**2*g*i**3 - 15*B*a**2*b**3*c**4*d*g*i*
*3 + B*a*b**4*c**5*g*i**3 + B*a*b**3*c**4*g*i**3*(5*a*d - b*c) - B*b**4*c**
5*g*i**3*(5*a*d - b*c)/d)/(B*a**5*d**5*g*i**3 - 5*B*a**4*b*c*d**4*g*i**3 +
10*B*a**3*b**2*c**2*d**3*g*i**3 - 10*B*a**2*b**3*c**3*d**2*g*i**3 - 5*B*a*b
**4*c**4*d*g*i**3 + B*b**5*c**5*g*i**3))/(20*d**2) + x**4*(A*a*d**3*g*i**3/
4 + 3*A*b*c*d**2*g*i**3/4 + B*a*d**3*g*i**3/20 - B*b*c*d**2*g*i**3/20) + (B
*a*c**3*g*i**3*x + 3*B*a*c**2*d*g*i**3*x**2/2 + B*a*c*d**2*g*i**3*x**3 + B*
a*d**3*g*i**3*x**4/4 + B*b*c**3*g*i**3*x**2/2 + B*b*c**2*d*g*i**3*x**3 + 3*
B*b*c*d**2*g*i**3*x**4/4 + B*b*d**3*g*i**3*x**5/5)*log(e*(a + b*x)/(c + d*x
)) + x**3*(60*A*a*b*c*d**2*g*i**3 + 60*A*b**2*c**2*d*g*i**3 + B*a**2*d**3*g
*i**3 + 10*B*a*b*c*d**2*g*i**3 - 11*B*b**2*c**2*d*g*i**3)/(60*b) - x**2*(-6
0*A*a*b**2*c**2*d*g*i**3 - 20*A*b**3*c**3*g*i**3 + B*a**3*d**3*g*i**3 - 5*B
*a**2*b*c*d**2*g*i**3 - 5*B*a*b**2*c**2*d*g*i**3 + 9*B*b**3*c**3*g*i**3)/(4
0*b**2) + x*(20*A*a*b**3*c**3*d*g*i**3 + B*a**4*d**4*g*i**3 - 5*B*a**3*b*c*
d**3*g*i**3 + 10*B*a**2*b**2*c**2*d**2*g*i**3 - 5*B*a*b**3*c**3*d*g*i**3 -
B*b**4*c**4*g*i**3)/(20*b**3*d)
```

Giac [B] time = 21.1528, size = 690, normalized size = 2.55

$$-\frac{1}{5}\left(Abd^3gi + Bbd^3gi\right)x^5 - \frac{1}{20}\left(15\,Abcd^2gi + 14\,Bbcd^2gi + 5\,Aad^3gi + 6\,Bad^3gi\right)x^4 - \frac{\left(60\,Ab^2c^2dgi + 49\,Bb^2c^2dgi + 60\,A\right.}{6\!\!\!\!\;}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="giac")
```

```
[Out] -1/5*(A*b*d^3*g*i + B*b*d^3*g*i)*x^5 - 1/20*(15*A*b*c*d^2*g*i + 14*B*b*c*d^
2*g*i + 5*A*a*d^3*g*i + 6*B*a*d^3*g*i)*x^4 - 1/60*(60*A*b^2*c^2*d*g*i + 49*
B*b^2*c^2*d*g*i + 60*A*a*b*c*d^2*g*i + 70*B*a*b*c*d^2*g*i + B*a^2*d^3*g*i)*
x^3/b - 1/20*(4*B*b*d^3*g*i*x^5 + 20*B*a*c^3*g*i*x + 5*(3*B*b*c*d^2*g*i + B
*a*d^3*g*i)*x^4 + 20*(B*b*c^2*d*g*i + B*a*c*d^2*g*i)*x^3 + 10*(B*b*c^3*g*i
+ 3*B*a*c^2*d*g*i)*x^2)*log((b*x + a)/(d*x + c)) - 1/40*(20*A*b^3*c^3*g*i +
 11*B*b^3*c^3*g*i + 60*A*a*b^2*c^2*d*g*i + 65*B*a*b^2*c^2*d*g*i + 5*B*a^2*b
*c*d^2*g*i - B*a^3*d^3*g*i)*x^2/b^2 - 1/20*(B*b*c^5*g*i - 5*B*a*c^4*d*g*i)*
log(-d*i*x - c*i)/d^2 + 1/20*(B*b^4*c^4*g*i - 20*A*a*b^3*c^3*d*g*i - 15*B*a
*b^3*c^3*d*g*i - 10*B*a^2*b^2*c^2*d^2*g*i + 5*B*a^3*b*c*d^3*g*i - B*a^4*d^4
*g*i)*x/(b^3*d) - 1/20*(10*B*a^2*b^3*c^3*g*i - 10*B*a^3*b^2*c^2*d*g*i + 5*B
*a^4*b*c*d^2*g*i - B*a^5*d^3*g*i)*log(b*x + a)/b^4
```

3.23 $\int (ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=149

$$\frac{i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d}-\frac{Bi^3x(bc-ad)^3}{4b^3}-\frac{Bi^3(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bi^3(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bi^3(c+dx)^3(bc}{12bd}$$

```
[Out] -(B*(b*c - a*d)^3*i^3*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*(c + d*x)^2)/(8*b^2
*d) - (B*(b*c - a*d)*i^3*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3*Log[a
 + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(4*d)
```

Rubi [A] time = 0.0805712, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d}-\frac{Bi^3x(bc-ad)^3}{4b^3}-\frac{Bi^3(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bi^3(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bi^3(c+dx)^3(bc}{12bd}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^3*i^3*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*(c + d*x)^2)/(8*b^2
*d) - (B*(b*c - a*d)*i^3*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3*Log[a
 + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(4*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (23c+23dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx = \frac{12167(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d} - \frac{B\int \frac{279841(bc-ad)(c+dx)^3}{a+bx}\,dx}{92d}$$

$$= \frac{12167(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d} - \frac{(12167B(bc-ad))\int \frac{(c+dx)^3}{a+bx}\,dx}{4d}$$

$$= \frac{12167(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4d} - \frac{(12167B(bc-ad))\int\left(\frac{d(bc-ad)^2}{b^3}\right.}{}$$

$$= -\frac{12167B(bc-ad)^3x}{4b^3} - \frac{12167B(bc-ad)^2(c+dx)^2}{8b^2d} - \frac{12167B(bc-ad)(}{12bd}$$

Mathematica [A] time = 0.0586556, size = 120, normalized size = 0.81

$$\frac{i^3\left((c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B(bc-ad)\left(3b^2(c+dx)^2(bc-ad)+6bdx(bc-ad)^2+6(bc-ad)^3\log(a+bx)+2b^3(c+dx)^3\right)}{6b^4}\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (i^3*(-(B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)^
2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/(6*b^4) + (c + d*x)^
4*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(4*d)
```

Maple [B] time = 0.171, size = 2172, normalized size = 14.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] -1/8*e^2/d*B*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4+1/2*e^2*d^2*B*i^3/
b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*c-e*d^2*B*i^3/b^2/(d*e/(d*x+c)*a-e/(d
*x+c)*b*c)*a^3*c+3/2*e*d*B*i^3/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c^2+1/4*
e^4/d*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4
*c^4*b^4-e^4*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^4*c^3*b^3*a+1/2*e^2*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^3*b-1/3
*e^3*d^2*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*c-e^4*A*i^3/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)^4*b^3*c^3*a-1/3*e^3*B*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^3*c^3*a-e^4*d^2*A*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b*c+3/2*e^4*d*
A*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^2*c^2+1/2*e^3*d*B*i^3/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^3*a^2*c^2*b+1/4/d*B*i^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-b*e)*c^4+1/4*e^4*d^3*A*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4+1/4*d^3
*B*i^3/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^4-B*i^3/b*ln(d*(b*e/d+
(a*d-b*c)*e/d/(d*x+c))-b*e)*a*c^3-e*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3
*a-1/8*e^2*d^3*B*i^3/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4+1/12*e^3*d^3*B
*i^3/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+3/2*d*B*i^3/b^2*ln(d*(b*e/d+(a*d
-b*c)*e/d/(d*x+c))-b*e)*a^2*c^2-d^2*B*i^3/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))-b*e)*a^3*c+1/4*e^4*d^3*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)^4*a^4-e^4*d^2*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b*c+2*e^4*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(
```

```
d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a*c^7/(d*x+c)^4-35/2*e^4*d^3*B*
i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4*c^4
/(d*x+c)^4+1/4*e/d*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^4*b+3/2*e^4*d*B*i^
3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*c
^2-1/4*e^4/d*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^4/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^4*c^8/(d*x+c)^4-1/4*e^4*d^7*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^8/(d*x+c)^4+1/4*e^4/d*A*i^3/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)^4*b^4*c^4-3/4*e^2*d*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^2*a^2*c^2+1/12*e^3/d*B*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4+1/4*e
*d^3*B*i^3/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4+2*e^4*d^6*B*i^3*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^7*c/(d*x+c)^4+1
4*e^4*d^4*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)^4*a^5*c^3/(d*x+c)^4+14*e^4*d^2*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c^5/(d*x+c)^4*b-7*e^4*d^5*B*i^3*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^6*c^2/(d*x+c)
^4-7*e^4*d*B*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)^4*a^2*c^6/(d*x+c)^4
```

Maxima [B] time = 1.18331, size = 593, normalized size = 3.98

$$\frac{1}{4}Ad^3i^3x^4 + Acd^2i^3x^3 + \frac{3}{2}Ac^2di^3x^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Bc^3i^3 + \frac{3}{2}\left(x^2\log\left(\frac{be}{dx\cdot}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/4*A*d^3*i^3*x^4 + A*c*d^2*i^3*x^3 + 3/2*A*c^2*d*i^3*x^2 + (x*log(b*e*x/(d
*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*c^3*i^3 +
 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2
*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*c^2*d*i^3 + 1/2*(2*x^3*log(b*e*x
/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d
^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*c*d^2
*i^3 + 1/24*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a
)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^
2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*d^3*i^3 + A*c^
3*i^3*x
```

Fricas [B] time = 0.838573, size = 664, normalized size = 4.46

$$\frac{6\,Ab^4d^4i^3x^4 - 6\,Bb^4c^4i^3\log(dx+c) + 2\left((12\,A-B)b^4cd^3 + Bab^3d^4\right)i^3x^3 + 3\left(3\,(4\,A-B)b^4c^2d^2 + 4\,Bab^3cd^3 - Ba^2b^2d^4\right)i^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*i^3*x^4 - 6*B*b^4*c^4*i^3*log(d*x + c) + 2*((12*A - B)*b^
4*c*d^3 + B*a*b^3*d^4)*i^3*x^3 + 3*(3*(4*A - B)*b^4*c^2*d^2 + 4*B*a*b^3*c*d
^3 - B*a^2*b^2*d^4)*i^3*x^2 + 6*((4*A - 3*B)*b^4*c^3*d + 6*B*a*b^3*c^2*d^2
- 4*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*i^3*x + 6*(4*B*a*b^3*c^3*d - 6*B*a^2*b^2
*c^2*d^2 + 4*B*a^3*b*c*d^3 - B*a^4*d^4)*i^3*log(b*x + a) + 6*(B*b^4*d^4*i^3
*x^4 + 4*B*b^4*c*d^3*i^3*x^3 + 6*B*b^4*c^2*d^2*i^3*x^2 + 4*B*b^4*c^3*d*i^3*
```

```
x)*log((b*e*x + a*e)/(d*x + c)))/(b^4*d)
```

Sympy [B] time = 5.2841, size = 719, normalized size = 4.83

$$\frac{Ad^3i^3x^4}{4} - \frac{Bai^3\left(ad-2bc\right)\left(a^2d^2-2abcd+2b^2c^2\right)\log\left(x+\frac{Ba^4cd^3i^3-4Ba^3bc^2d^2i^3+6Ba^2b^2c^3di^3+\frac{Ba^2di^3(ad-2bc)\left(a^2d^2-2abcd+2b^2c^2\right)}{b}-5Bab^3\cdots}{Ba^4d^4i^3-4Ba^3bcd^3i^3+6Ba^2b^2c^2d^2i^3-4Bab^3c^3di\cdots}\right.}{4b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*d**3*i**3*x**4/4 - B*a*i**3*(a*d - 2*b*c)*(a**2*d**2 - 2*a*b*c*d + 2*b**2
*c**2)*log(x + (B*a**4*c*d**3*i**3 - 4*B*a**3*b*c**2*d**2*i**3 + 6*B*a**2*b
**2*c**3*d*i**3 + B*a**2*d*i**3*(a*d - 2*b*c)*(a**2*d**2 - 2*a*b*c*d + 2*b*
*2*c**2)/b - 5*B*a*b**3*c**4*i**3 - B*a*c*i**3*(a*d - 2*b*c)*(a**2*d**2 - 2
*a*b*c*d + 2*b**2*c**2))/(B*a**4*d**4*i**3 - 4*B*a**3*b*c*d**3*i**3 + 6*B*a
**2*b**2*c**2*d**2*i**3 - 4*B*a*b**3*c**3*d*i**3 - B*b**4*c**4*i**3))/(4*b*
*4) - B*c**4*i**3*log(x + (B*a**4*c*d**3*i**3 - 4*B*a**3*b*c**2*d**2*i**3 +
 6*B*a**2*b**2*c**3*d*i**3 - 4*B*a*b**3*c**4*i**3 - B*b**4*c**5*i**3/d)/(B*
a**4*d**4*i**3 - 4*B*a**3*b*c*d**3*i**3 + 6*B*a**2*b**2*c**2*d**2*i**3 - 4*
B*a*b**3*c**3*d*i**3 - B*b**4*c**4*i**3))/(4*d) + (B*c**3*i**3*x + 3*B*c**2
*d*i**3*x**2/2 + B*c*d**2*i**3*x**3 + B*d**3*i**3*x**4/4)*log(e*(a + b*x)/(
c + d*x)) + x**3*(12*A*b*c*d**2*i**3 + B*a*d**3*i**3 - B*b*c*d**2*i**3)/(12
*b) - x**2*(-12*A*b**2*c**2*d*i**3 + B*a**2*d**3*i**3 - 4*B*a*b*c*d**2*i**3
 + 3*B*b**2*c**2*d*i**3)/(8*b**2) + x*(4*A*b**3*c**3*i**3 + B*a**3*d**3*i**
3 - 4*B*a**2*b*c*d**2*i**3 + 6*B*a*b**2*c**2*d*i**3 - 3*B*b**3*c**3*i**3)/(
4*b**3)
```

Giac [B] time = 1.49911, size = 606, normalized size = 4.07

$$-\frac{1}{4}\left(Ad^3i+Bd^3i\right)x^4 - \frac{\left(12\,Abcd^2i+11\,Bbcd^2i+Bad^3i\right)x^3}{12\,b} - \frac{1}{4}\left(Bd^3ix^4+4\,Bcd^2ix^3+6\,Bc^2dix^2+4\,Bc^3ix\right)\log\left(\frac{bx+a}{dx+c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] -1/4*(A*d^3*i + B*d^3*i)*x^4 - 1/12*(12*A*b*c*d^2*i + 11*B*b*c*d^2*i + B*a*
d^3*i)*x^3/b - 1/4*(B*d^3*i*x^4 + 4*B*c*d^2*i*x^3 + 6*B*c^2*d*i*x^2 + 4*B*c
^3*i*x)*log((b*x + a)/(d*x + c)) - 1/8*(12*A*b^2*c^2*d*i + 9*B*b^2*c^2*d*i
+ 4*B*a*b*c*d^2*i - B*a^2*d^3*i)*x^2/b^2 - 1/4*(4*A*b^3*c^3*i + B*b^3*c^3*i
 + 6*B*a*b^2*c^2*d*i - 4*B*a^2*b*c*d^2*i + B*a^3*d^3*i)*x/b^3 + 1/8*(B*b^4*
c^4*i - 4*B*a*b^3*c^3*d*i + 6*B*a^2*b^2*c^2*d^2*i - 4*B*a^3*b*c*d^3*i + B*a
^4*d^4*i)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^4*d) - 1/8*(B*b^5*c^5*
i + 3*B*a*b^4*c^4*d*i - 10*B*a^2*b^3*c^3*d^2*i + 10*B*a^3*b^2*c^2*d^3*i - 5
*B*a^4*b*c*d^4*i + B*a^5*d^5*i)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a
*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/(b^4*d*abs(-b*c + a*d))
```

3.24 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=356

$$\frac{Bi^3(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g}+\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g}+\frac{di^3(a+bx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.}{b^4g}$$

```
[Out] (-5*B*d*(b*c - a*d)^2*i^3*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*(c + d*x)^2)/(6
*b^2*g) - (5*B*(b*c - a*d)^3*i^3*Log[(a + b*x)/(c + d*x)])/(6*b^4*g) + (d*(
b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g) +
((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g
) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*g) - (11*B*
(b*c - a*d)^3*i^3*Log[c + d*x])/(6*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[(
e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (B
*(b*c - a*d)^3*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)
```

Rubi [A] time = 0.601841, antiderivative size = 436, normalized size of antiderivative = 1.22, number of steps used = 23, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^3(bc-ad)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g}+\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g}+\frac{i^3(bc-ad)^3\log(ag+bgx)\left(B\log\left(\frac{e(a+}{c+d}\right.\right.}{b^4g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x),x]
```

```
[Out] (A*d*(b*c - a*d)^2*i^3*x)/(b^3*g) - (5*B*d*(b*c - a*d)^2*i^3*x)/(6*b^3*g) -
 (B*(b*c - a*d)*i^3*(c + d*x)^2)/(6*b^2*g) - (5*B*(b*c - a*d)^3*i^3*Log[a +
 b*x])/(6*b^4*g) - (B*(b*c - a*d)^3*i^3*Log[g*(a + b*x)]^2)/(2*b^4*g) + (B*
d*(b*c - a*d)^2*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^4*g) + ((b*c
 - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g) + (
i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*g) - (B*(b*c - a
*d)^3*i^3*Log[c + d*x])/(b^4*g) + ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[a*g + b*g*x])/(b^4*g) + (B*(b*c - a*d)^3*i^3*Log[(b*(c +
 d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b^4*g) + (B*(b*c - a*d)^3*i^3*PolyLo
g[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
```

```
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(24c+24dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ag+bgx}dx = \int\left(\frac{13824d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g}+\frac{576d(bc-ad)(24c+24dx)\left(A\right.}{b^2g}\right.$$

$$= \frac{\left(13824(bc-ad)^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}dx}{b^3}+\frac{(24d)\int(24c+24dx)^2\left(A+B\log\left(\frac{e}{}\right.\right.}{bg}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g}+\frac{6912(bc-ad)(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g}+\frac{4608}{}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g}+\frac{13824Bd(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g}+\frac{6912(bc-}{}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g}+\frac{13824Bd(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g}+\frac{6912(bc-}{}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g}-\frac{11520Bd(bc-ad)^2x}{b^3g}-\frac{2304B(bc-ad)(c+dx)^2}{b^2g}-\frac{11}{}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g}-\frac{11520Bd(bc-ad)^2x}{b^3g}-\frac{2304B(bc-ad)(c+dx)^2}{b^2g}-\frac{11}{}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g}-\frac{11520Bd(bc-ad)^2x}{b^3g}-\frac{2304B(bc-ad)(c+dx)^2}{b^2g}-\frac{11}{}$$

$$= \frac{13824Ad(bc-ad)^2x}{b^3g}-\frac{11520Bd(bc-ad)^2x}{b^3g}-\frac{2304B(bc-ad)(c+dx)^2}{b^2g}-\frac{11}{}$$

Mathematica [A] time = 0.265892, size = 352, normalized size = 0.99

$$\frac{i^3\left(-3B(bc-ad)^3\left(\log(g(a+bx))\left(\log(g(a+bx))-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+3b^2(c+dx)^2(bc-ad)\left(B\,\mathrm{l}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x),x]
```

```
[Out] (i^3*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[
a + b*x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c -
```

```
a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c
+ d*x)] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
) + 2*b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^
3*Log[g*(a + b*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3
*Log[c + d*x] - 3*B*(b*c - a*d)^3*(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]
)))/(6*b^4*g)
```

Maple [B] time = 0.192, size = 4594, normalized size = 12.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] 1/2*B*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c^3+A*i^3/g/b*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*c^3-B*i^3/g/b*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*
e)/b/e)*c^3+11/6*B*i^3/g/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^3-A*i^
3/g/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^3+5/6*e*B*i^3/g/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)*c^3-e*A*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3-1/2*e^2*
B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^5
/(d*x+c)^2*b+e*d^3*B*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)*a^3+1/3*e^3*d^3*B*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3-e^3*d^2*B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c-3/2*e^2*d*B*i^3/g*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^2-1/2*e^2*d^3*B*
i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a
^3+e*d^3*A*i^3/g/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3-5/6*e*d^3*B*i^3/g/b^
3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+3*d*B*i^3/g/b^2*dilog(-(d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-b*e)/b/e)*c^2*a-1/6*e^2*B*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)^2*c^3*b-1/3*e^3*A*i^3/g*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3-11/6*d^
3*B*i^3/g/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3-d^3*A*i^3/g/b^4*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^3-1/2*d^3*B*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2*a^3+d^3*B*i^3/g/b^4*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b
*e)/b/e)*a^3+d^3*A*i^3/g/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3-1/
2*e^2*d^3*A*i^3/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3-2*e^3*d^5*B*i^3/g
/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5/(d
*x+c)^3*c+5*e^3*d^4*B*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^3*a^4/(d*x+c)^3*c^2-20/3*e^3*d^3*B*i^3/g/b*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3/(d*x+c)^3*c^3-4*e*d^
3*B*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
*a^3/(d*x+c)*c+6*e*d^2*B*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)*a^2/(d*x+c)*c^2-4*e*d*B*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3/(d*x+c)*a-5/2*e^2*d^4*B*i^3/g/
b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*
x+c)^2*c+5*e^2*d^3*B*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c^2-5*e^2*d^2*B*i^3/g/b*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*c^3-2*e^3*d*B*
i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^5/(
d*x+c)^3*a*b-e*B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)*c^3-B*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-
b*c)*e/d/(d*x+c))-b*e)/b/e)*c^3+1/2*e^2*A*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^2*c^3*b-3*d^2*B*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+
(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2*c+3*d*B*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*c^2-1/2*e^2*d^
2*B*i^3/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+e^3*d*B*i^3/g*ln(b*e/d+(a
```

```
*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^2*b*a+3/2*e^2*d^2*B*
i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2
*c+5*e^3*d^2*B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)^3*c^4/(d*x+c)^3*a^2+e*d^4*B*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4/(d*x+c)-3*e*d^2*B*i^3/g/b^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c+3*e*d*B*i^3/g/b*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c^2+1/3*e^3*
d^6*B*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^3*a^6/(d*x+c)^3+1/2*e^2*d^5*B*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/
(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^5/(d*x+c)^2+5/2*e^2*d*B*i^3/g*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2*a+5/2*e*
d^2*B*i^3/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c-5/2*e*d*B*i^3/g/b/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)*a*c^2+e^3*d*A*i^3/g*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^3*c^2*a+3/2*e^2*d^2*A*i^3/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c-3*e*d
^2*A*i^3/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c+3*e*d*A*i^3/g/b/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)*a*c^2+1/3*e^3*B*i^3/g*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3+1/3*e^3*d^3*A*i^3/g/b/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3+1/2*e^2*d*B*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)^2*a*c^2-3*d*A*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c^2*a-3*d^2*
A*i^3/g/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c+3*d*A*i^3/g/b^2*l
n(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2*a+d^3*B*i^3/g/b^4*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^3+11/2*d
^2*B*i^3/g/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c+3*d^2*A*i^3/g/
b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^2*c-11/2*d*B*i^3/g/b^2*ln(d*(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-b*e)*c^2*a+3/2*d^2*B*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2*a^2*c+1/2*e^2*B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^2*c^3*b+e*B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)*c^4/(d*x+c)-3/2*d*B*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2*c^2*a-3*d^2*B*i^3/g/b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))-b*e)/b/e)*a^2*c-1/3*e^3*B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)^3*c^3*b^2-3/2*e^2*d*A*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)^2*c^2*a+1/6*e^2*d^3*B*i^3/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3-e^
3*d^2*A*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c
```

Maxima [B] time = 1.58277, size = 1148, normalized size = 3.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorit
hm="maxima")
```

```
[Out] 3*A*c^2*d*i^3*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/6*A*d^3*i^3*(6*a^3*log
(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) + 3/2*A*c*d^
2*i^3*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A*c^3*i^3*lo
g(b*g*x + a*g)/(b*g) - 1/6*(11*b^2*c^3*i^3 - 15*a*b*c^2*d*i^3 + 6*a^2*c*d^2
*i^3)*B*log(d*x + c)/(b^3*g) + (b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c
*d^2*i^3 - a^3*d^3*i^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) +
dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g) + 1/6*(2*B*b^3*d^3*i^3*x^3*log
(e) + ((9*i^3*log(e) - i^3)*b^3*c*d^2 - (3*i^3*log(e) - i^3)*a*b^2*d^3)*B*x
^2 + 3*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*i^3)*
B*log(b*x + a)^2 + ((18*i^3*log(e) - 7*i^3)*b^3*c^2*d - 6*(3*i^3*log(e) - 2
*i^3)*a*b^2*c*d^2 + (6*i^3*log(e) - 5*i^3)*a^2*b*d^3)*B*x + (2*B*b^3*d^3*i^
3*x^3 + 3*(3*b^3*c*d^2*i^3 - a*b^2*d^3*i^3)*B*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*
a*b^2*c*d^2*i^3 + a^2*b*d^3*i^3)*B*x + (6*b^3*c^3*i^3*log(e) - 18*(i^3*log(
e) - i^3)*a*b^2*c^2*d + 9*(2*i^3*log(e) - 3*i^3)*a^2*b*c*d^2 - (6*i^3*log(e
```

```
) - 11*i^3)*a^3*d^3)*B)*log(b*x + a) - (2*B*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^
2*i^3 - a*b^2*d^3*i^3)*B*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2
*b*d^3*i^3)*B*x + 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 -
a^3*d^3*i^3)*B*log(b*x + a))*log(d*x + c))/(b^4*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^3i^3x^3 + 3\,Acd^2i^3x^2 + 3\,Ac^2di^3x + Ac^3i^3 + \left(Bd^3i^3x^3 + 3\,Bcd^2i^3x^2 + 3\,Bc^2di^3x + Bc^3i^3\right)\log\left(\frac{bex+ae}{dx+c}\right)}{bgx + ag}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorit
hm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log((b*e
*x + a*e)/(d*x + c)))/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{bgx + ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorit
hm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g),
 x)
```

3.25 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=373

$$\frac{3Bdi^3(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2}+\frac{2d^2i^3(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}+\frac{di^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g^2}$$

```
[Out] -(B*d^2*(b*c - a*d)*i^3*x)/(2*b^3*g^2) - (B*(b*c - a*d)^2*i^3*(c + d*x))/(b
^3*g^2*(a + b*x)) - (B*d*(b*c - a*d)^2*i^3*Log[(a + b*x)/(c + d*x)])/(2*b^4
*g^2) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c +
d*x)]))/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(2*b^2*g^2) - (5*B*d*(b*c - a*d)^2*i^3*Log[c + d*x])/(2*b^4*g^2
) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*
(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (3*B*d*(b*c - a*d)^2*i^3*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)
```

Rubi [A] time = 0.695625, antiderivative size = 521, normalized size of antiderivative = 1.4, number of steps used = 22, number of rules used = 14, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bdi^3(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g^2}-\frac{a^2Bd^3i^3\log(a+bx)}{2b^4g^2}+\frac{d^3i^3x^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^2g^2}+\frac{3di^3(bc-ad)^2\log(a+bx)}{b^4g^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^2,
x]
```

```
[Out] (A*d^2*(3*b*c - 2*a*d)*i^3*x)/(b^3*g^2) - (B*d^2*(b*c - a*d)*i^3*x)/(2*b^3*
g^2) - (B*(b*c - a*d)^3*i^3)/(b^4*g^2*(a + b*x)) - (a^2*B*d^3*i^3*Log[a + b
*x])/(2*b^4*g^2) - (B*d*(b*c - a*d)^2*i^3*Log[a + b*x])/(b^4*g^2) - (3*B*d*
(b*c - a*d)^2*i^3*Log[a + b*x]^2)/(2*b^4*g^2) + (B*d^2*(3*b*c - 2*a*d)*i^3*
(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^4*g^2) + (d^3*i^3*x^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^2) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(b^4*g^2*(a + b*x)) + (3*d*(b*c - a*d)^2*i^3*Log[a
+ b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) + (B*c^2*d*i^3*Log[c
 + d*x])/(2*b^2*g^2) - (B*d*(3*b*c - 2*a*d)*(b*c - a*d)*i^3*Log[c + d*x])/(
b^4*g^2) + (B*d*(b*c - a*d)^2*i^3*Log[c + d*x])/(b^4*g^2) + (3*B*d*(b*c - a
*d)^2*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^2) + (3*B*d*(
b*c - a*d)^2*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
```

```
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(25c+25dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^2}\,dx = \int\left(\frac{15625d^2(3bc-2ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2}+\frac{15625d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^2g^2}\right.$$

$$=\frac{\left(15625d^3\right)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b^2g^2}+\frac{\left(15625d^2(3bc-2ad)\right)\int\left(A+B\log\right.}{b^3g^2}$$

$$=\frac{15625Ad^2(3bc-2ad)x}{b^3g^2}+\frac{15625d^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^2}-\frac{15625(bc-ad)}{b^4}$$

$$=\frac{15625Ad^2(3bc-2ad)x}{b^3g^2}+\frac{15625Bd^2(3bc-2ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2}+\frac{1562}{}$$

$$=\frac{15625Ad^2(3bc-2ad)x}{b^3g^2}+\frac{15625Bd^2(3bc-2ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2}+\frac{1562}{}$$

$$=\frac{15625Ad^2(3bc-2ad)x}{b^3g^2}-\frac{15625Bd^2(bc-ad)x}{2b^3g^2}-\frac{15625B(bc-ad)^3}{b^4g^2(a+bx)}-\frac{15625}{}$$

$$=\frac{15625Ad^2(3bc-2ad)x}{b^3g^2}-\frac{15625Bd^2(bc-ad)x}{2b^3g^2}-\frac{15625B(bc-ad)^3}{b^4g^2(a+bx)}-\frac{15625}{}$$

$$=\frac{15625Ad^2(3bc-2ad)x}{b^3g^2}-\frac{15625Bd^2(bc-ad)x}{2b^3g^2}-\frac{15625B(bc-ad)^3}{b^4g^2(a+bx)}-\frac{15625}{}$$

$$=\frac{15625Ad^2(3bc-2ad)x}{b^3g^2}-\frac{15625Bd^2(bc-ad)x}{2b^3g^2}-\frac{15625B(bc-ad)^3}{b^4g^2(a+bx)}-\frac{15625}{}$$

Mathematica [A] time = 0.406583, size = 374, normalized size = 1.

$$i^3\left(-3Bd(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-a^2Bd^3\log(a+bx)+b^2d^3x^2\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^2,x]
```

```
[Out] (i^3*(2*A*b*d^2*(3*b*c - 2*a*d)*x - b*B*d^2*(b*c - a*d)*x - (2*B*(b*c - a*d
)^3)/(a + b*x) - a^2*B*d^3*Log[a + b*x] - 2*B*d*(b*c - a*d)^2*Log[a + b*x]
+ 2*B*d^2*(3*b*c - 2*a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^3*
x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (2*(b*c - a*d)^3*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(a + b*x) + 6*d*(b*c - a*d)^2*Log[a + b*x]*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]) + b^2*B*c^2*d*Log[c + d*x] + 2*B*d*(b*c - a*d)^
2*Log[c + d*x] - 2*B*d*(-(b*c) + a*d)*(-3*b*c + 2*a*d)*Log[c + d*x] - 3*B*d
*(b*c - a*d)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(2*b^4*g^2)
```

Maple [B] time = 0.179, size = 3141, normalized size = 8.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x)
```

```
[Out] -3*d*B*i^3/g^2/b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c^2-e*
B*i^3/g^2/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))*c^2-3*d^3*B*i^3/g^2/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+
(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2+6*d^2*A*i^3/g^2/b^3*ln(d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-b*e)*a*c+1/2*e^2*d^3*A*i^3/g^2/b^2/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)^2*a^2-e*d^2*B*i^3/g^2/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a^2+6*
e*d^3*B*i^3/g^2/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)*a^2/(d*x+c)*c-6*e*d^2*B*i^3/g^2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/
(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2/(d*x+c)*a+2*e^2*d^2*B*i^3/g^2/b*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3/(d*x+c)^2*a+2*e^
2*d^4*B*i^3/g^2/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)^2*a^3/(d*x+c)^2*c-e*d^2*B*i^3/g^2/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*
a*c+1/2*e^2*d^3*B*i^3/g^2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)^2*a^2+1/2*e^2*d*A*i^3/g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*
c^2+3*d*A*i^3/g^2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c^2-3*d^3*B*i^3/g^2/b
^4*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2+3/2*d^3*B*i^3/g^2/
b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a^2+3/2*d*B*i^3/g^2/b^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2*c^2-3*d*A*i^3/g^2/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))-b*e)*c^2+5/2*d^3*B*i^3/g^2/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a
^2+5/2*d*B*i^3/g^2/b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2-3*d^3*A*
i^3/g^2/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-e*B*i^3/g^2/b/(b*e/
d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c^2-e*A*i^3/g^2/b/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)*c^2-e^2*d^2*B*i^3/g^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^2*a*c+1/2*e*d^3*B*i^3/g^2/b^3/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)*a^2+3*d^3*A*i^3/g^2/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^2-e^2*d^2*A
*i^3/g^2/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c-1/2*e^2*d*B*i^3/g^2*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2-e*d^2
```

```
*B*i^3/g^2/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*a^2-2*e*d^3*B*i^3/g^2/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)*a^2-2*e*d*B*i^3/g^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/
(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+6*d^2*B*i^3/g^2/b^3*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*c+4*e*d^2*A*i^3
/g^2/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c+2*e*d*A*i^3/g^2/b^2/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)*a*c+2*e*d*B*i^3/g^2/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)*a*c-3*e^2*d^3*B*i^3/g^2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*c^2-1/2*e^2*d^5*B*i^3/g^2/b^4*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2+4*
e*d^2*B*i^3/g^2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)*a*c-2*e*d^4*B*i^3/g^2/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)+2*e*d*B*i^3/g^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3/(d*x+c)+2*e*d*B*i^3/g^2/b^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a*c+1/2*e*d*B
*i^3/g^2/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2-e*d^2*A*i^3/g^2/b^3/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)*a^2-2*e*d^3*A*i^3/g^2/b^3/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)*a^2-2*e*d*A*i^3/g^2/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2-3*d*B*i^3/g^
2/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
b*e)/b/e)*c^2+6*d^2*B*i^3/g^2/b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b
*e)/b/e)*a*c-6*d^2*A*i^3/g^2/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c*a+1/2*e^
2*d*B*i^3/g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
^2*c^2-3*d^2*B*i^3/g^2/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a*c-5*d^2*B*i^
3/g^2/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*c
```

Maxima [B] time = 1.70177, size = 2026, normalized size = 5.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algor
ithm="maxima")
```

```
[Out] -3*A*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2
))*c*d^2*i^3 + 1/2*(2*a^3/(b^5*g^2*x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b^4
*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2))*A*d^3*i^3 + 3*A*c^2*d*i^3*(a/(b^3*g^2*x
+ a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - B*c^3*i^3*(log(b*e*x/(d*x + c) + a
*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x + a*b*g^2) + d*log(b*x +
 a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - A*c^3*i
^3/(b^2*g^2*x + a*b*g^2) - 1/2*(5*b^3*c^3*d*i^3 - 3*a*b^2*c^2*d^2*i^3 - 2*a
^2*b*c*d^3*i^3 + 2*a^3*d^4*i^3)*B*log(d*x + c)/(b^5*c*g^2 - a*b^4*d*g^2) +
1/2*((b^4*c*d^3*i^3*log(e) - a*b^3*d^4*i^3*log(e))*B*x^3 + ((6*i^3*log(e) -
 i^3)*b^4*c^2*d^2 - (9*i^3*log(e) - 2*i^3)*a*b^3*c*d^3 + (3*i^3*log(e) - i^
3)*a^2*b^2*d^4)*B*x^2 + ((6*i^3*log(e) - i^3)*a*b^3*c^2*d^2 - 2*(5*i^3*log(
e) - i^3)*a^2*b^2*c*d^3 + (4*i^3*log(e) - i^3)*a^3*b*d^4)*B*x + 3*((b^4*c^3
*d*i^3 - 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B*x + (
a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*
B)*log(b*x + a)^2 + 2*(3*(i^3*log(e) + i^3)*a*b^3*c^3*d - 6*(i^3*log(e) + i
^3)*a^2*b^2*c^2*d^2 + 4*(i^3*log(e) + i^3)*a^3*b*c*d^3 - (i^3*log(e) + i^3)
*a^4*d^4)*B + ((b^4*c*d^3*i^3 - a*b^3*d^4*i^3)*B*x^3 + 3*(2*b^4*c^2*d^2*i^3
 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B*x^2 + (6*b^4*c^3*d*i^3*log(e) - 1
8*(i^3*log(e) - i^3)*a*b^3*c^2*d^2 + 9*(2*i^3*log(e) - 3*i^3)*a^2*b^2*c*d^3
 - (6*i^3*log(e) - 11*i^3)*a^3*b*d^4)*B*x - (18*a^2*b^2*c^2*d^2*i^3*log(e)
- 6*(i^3*log(e) + i^3)*a*b^3*c^3*d - 9*(2*i^3*log(e) - i^3)*a^3*b*c*d^3 + (
6*i^3*log(e) - 5*i^3)*a^4*d^4)*B)*log(b*x + a) - ((b^4*c*d^3*i^3 - a*b^3*d^
4*i^3)*B*x^3 + 3*(2*b^4*c^2*d^2*i^3 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*
```

```
B*x^2 + 2*(3*a*b^3*c^2*d^2*i^3 - 5*a^2*b^2*c*d^3*i^3 + 2*a^3*b*d^4*i^3)*B*x
 + 2*(3*a*b^3*c^3*d*i^3 - 6*a^2*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^3*i^3 - a^4*d
^4*i^3)*B + 6*((b^4*c^3*d*i^3 - 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 -
 a^3*b*d^4*i^3)*B*x + (a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*
d^3*i^3 - a^4*d^4*i^3)*B)*log(b*x + a))*log(d*x + c))/(a*b^5*c*g^2 - a^2*b^
4*d*g^2 + (b^6*c*g^2 - a*b^5*d*g^2)*x) + 3*(b^2*c^2*d*i^3 - 2*a*b*c*d^2*i^3
 + a^2*d^3*i^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(
b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^3i^3x^3 + 3\,Acd^2i^3x^2 + 3\,Ac^2di^3x + Ac^3i^3 + \left(Bd^3i^3x^3 + 3\,Bcd^2i^3x^2 + 3\,Bc^2di^3x + Bc^3i^3\right)\log\left(\frac{bex+ae}{dx+c}\right)}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algor
ithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log((b*e
*x + a*e)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{\left(bgx + ag\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^
2, x)
```

3.26 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=345

$$\frac{3Bd^2i^3(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3}+\frac{d^3i^3(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^3}-\frac{3d^2i^3(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^4g^3}$$

```
[Out] (-2*B*d*(b*c - a*d)*i^3*(c + d*x))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d)*i^3
*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d*x
)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^3*(a + b*x)^2) - (B*d^2*
(b*c - a*d)*i^3*Log[c + d*x])/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3)
+ (3*B*d^2*(b*c - a*d)*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^
3)
```

Rubi [A] time = 0.717528, antiderivative size = 442, normalized size of antiderivative = 1.28, number of steps used = 22, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bd^2i^3(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g^3}+\frac{3d^2i^3(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^3}-\frac{3di^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^4g^3(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^3,
x]
```

```
[Out] (A*d^3*i^3*x)/(b^3*g^3) - (B*(b*c - a*d)^3*i^3)/(4*b^4*g^3*(a + b*x)^2) - (
5*B*d*(b*c - a*d)^2*i^3)/(2*b^4*g^3*(a + b*x)) - (5*B*d^2*(b*c - a*d)*i^3*L
og[a + b*x])/(2*b^4*g^3) - (3*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]^2)/(2*b^4*
g^3) + (B*d^3*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^4*g^3) - ((b*c
 - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^4*g^3*(a + b*x)^2)
 - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3*(a
 + b*x)) + (3*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*Log[c + d*x])/(2*b^4*g^3) +
(3*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*
g^3) + (3*B*d^2*(b*c - a*d)*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(
b^4*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
```

```
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

```
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(26c+26dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^3}\,dx = \int\left(\frac{17576d^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3}+\frac{17576(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^3}+\right.$$

$$=\frac{\left(17576d^3\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{b^3g^3}+\frac{\left(52728d^2(bc-ad)\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}}{b^3g^3}$$

$$=\frac{17576Ad^3x}{b^3g^3}-\frac{8788(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}-\frac{52728d(bc-ad)^2\left(A\right.}{b^4g^3(a+}$$

$$=\frac{17576Ad^3x}{b^3g^3}+\frac{17576Bd^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^3}-\frac{8788(bc-ad)^3\left(A+B\log\left(\right.\right.}{b^4g^3(a+bx)^2}$$

$$=\frac{17576Ad^3x}{b^3g^3}+\frac{17576Bd^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^3}-\frac{8788(bc-ad)^3\left(A+B\log\left(\right.\right.}{b^4g^3(a+bx)^2}$$

$$=\frac{17576Ad^3x}{b^3g^3}-\frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)}-\frac{43940Bd^2(bc-ad)}{b^4g^3}$$

$$=\frac{17576Ad^3x}{b^3g^3}-\frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)}-\frac{43940Bd^2(bc-ad)}{b^4g^3}$$

$$=\frac{17576Ad^3x}{b^3g^3}-\frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)}-\frac{43940Bd^2(bc-ad)}{b^4g^3}$$

$$=\frac{17576Ad^3x}{b^3g^3}-\frac{4394B(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{43940Bd(bc-ad)^2}{b^4g^3(a+bx)}-\frac{43940Bd^2(bc-ad)}{b^4g^3}$$

Mathematica [A] time = 0.439761, size = 314, normalized size = 0.91

$$\frac{i^3\left(6Bd^2(ad-bc)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+12d^2(bc-ad)\log(a+bx)\left(B\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^3,x]
```

```
[Out] (i^3*(4*A*b*d^3*x - (B*(b*c - a*d)^3)/(a + b*x)^2 - (10*B*d*(b*c - a*d)^2)/
(a + b*x) + 10*B*d^2*(-(b*c) + a*d)*Log[a + b*x] + 4*B*d^3*(a + b*x)*Log[(e
*(a + b*x))/(c + d*x)] - (2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/(a + b*x)^2 - (12*d*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(a + b*x) + 12*d^2*(b*c - a*d)*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c +
 d*x)]) + 6*B*d^2*(b*c - a*d)*Log[c + d*x] + 6*B*d^2*(-(b*c) + a*d)*(Log[a
+ b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)])))/(4*b^4*g^3)
```

Maple [B] time = 0.164, size = 1855, normalized size = 5.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x)
```

```
[Out] e*d^4*i^3/g^3*B/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)/(d*x+c)*a^2+e*d^2*i^3/g^3*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e
/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2+1/4*e^2*d*i^3/g^3*B/b^2/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*a+2*e*d^2*i^3/g^3*A/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)*a-1/2*e^2*i^3/g^3*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*c+3*d^3*i^3/g^3*B/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a-3*d^2*i^3/g^3*B/b^3*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b
/e)*c-2*e*d*i^3/g^3*A/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+e*d^3*i^3/g
^3*A/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e*d^2*i^3/g^3*A/b^2/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)*c+2*e*d^2*i^3/g^3*B/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
*a-2*e*d*i^3/g^3*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+1/2*e^2*d*i^3/
g^3*A/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-2*e*d^3*i^3/g^3*B/b^3*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*c-3*d^
3*i^3/g^3*A/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*d^2*i^3/g^3*A/b^3*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*c+e*d^3*i^3/g^3*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e*d^2*i^3/g^3*B/b^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c+2*e*d^2*i^3/g^3*B/b^3/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2*e*d*i^3/g
^3*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*c+1/2*e^2*d*i^3/g^3*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*a-3*d^2*i^3/g^3*B/b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))-b*e)/b/e)*c-d^3*i^3/g^3*B/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
b*e)*a+d^2*i^3/g^3*B/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-1/4*e^2*
i^3/g^3*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/2*e^2*i^3/g^3*A/b/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+3*d^3*i^3/g^3*A/b^4*ln(d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-b*e)*a-3*d^2*i^3/g^3*A/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-b*e)*c-3/2*d^3*i^3/g^3*B/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+3/2*d^
2*i^3/g^3*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+3*d^3*i^3/g^3*B/b^4*dil
og(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a
```

Maxima [B] time = 1.88724, size = 3108, normalized size = 9.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algor
ithm="maxima")
```

```
[Out] -3/4*B*c^2*d*i^3*(2*(2*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g
^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b
*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^
3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^
3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*
a*b^3*c*d + a^2*b^2*d^2)*g^3)) - 1/2*A*d^3*i^3*((6*a^2*b*x + 5*a^3)/(b^6*g^
3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log(b*x + a)/(b^
4*g^3)) + 3/2*A*c*d^2*i^3*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x +
 a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 1/4*B*c^3*i^3*((2*b*d*x - b*c +
 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b
^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2
+ 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d +
 a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*
g^3)) - 3/2*(2*b*x + a)*A*c^2*d*i^3/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*
g^3) - 1/2*A*c^3*i^3/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*(2*b^3
*c^3*d^2*i^3 + 8*a*b^2*c^2*d^3*i^3 - 13*a^2*b*c*d^4*i^3 + 5*a^3*d^5*i^3)*B*
log(d*x + c)/(b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 + a^2*b^4*d^2*g^3) + 1/4*(4*(b^
5*c^2*d^3*i^3*log(e) - 2*a*b^4*c*d^4*i^3*log(e) + a^2*b^3*d^5*i^3*log(e))*B
*x^3 + 8*(a*b^4*c^2*d^3*i^3*log(e) - 2*a^2*b^3*c*d^4*i^3*log(e) + a^3*b^2*d
^5*i^3*log(e))*B*x^2 + 2*(12*(i^3*log(e) + i^3)*a*b^4*c^3*d^2 - (28*i^3*log
(e) + 27*i^3)*a^2*b^3*c^2*d^3 + 20*(i^3*log(e) + i^3)*a^3*b^2*c*d^4 - (4*i^
3*log(e) + 5*i^3)*a^4*b*d^5)*B*x + 6*((b^5*c^3*d^2*i^3 - 3*a*b^4*c^2*d^3*i^
3 + 3*a^2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 + 2*(a*b^4*c^3*d^2*i^3 - 3
*a^2*b^3*c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x + (a^2*b^3*
c^3*d^2*i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^4*i^3 - a^5*d^5*i^3)*B)*l
og(b*x + a)^2 + (3*(6*i^3*log(e) + 7*i^3)*a^2*b^3*c^3*d^2 - (46*i^3*log(e)
+ 47*i^3)*a^3*b^2*c^2*d^3 + (38*i^3*log(e) + 35*i^3)*a^4*b*c*d^4 - (10*i^3*
log(e) + 9*i^3)*a^5*d^5)*B + 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^4*i^3 + a^
2*b^3*d^5*i^3)*B*x^3 + (6*b^5*c^3*d^2*i^3*log(e) - 18*(i^3*log(e) - i^3)*a*
b^4*c^2*d^3 + 9*(2*i^3*log(e) - 3*i^3)*a^2*b^3*c*d^4 - (6*i^3*log(e) - 11*i
^3)*a^3*b^2*d^5)*B*x^2 - 2*(18*a^2*b^3*c^2*d^3*i^3*log(e) - 6*(i^3*log(e) +
 i^3)*a*b^4*c^3*d^2 - 9*(2*i^3*log(e) - i^3)*a^3*b^2*c*d^4 + (6*i^3*log(e)
- 5*i^3)*a^4*b*d^5)*B*x + (18*a^4*b*c*d^4*i^3*log(e) + 3*(2*i^3*log(e) + 3*
i^3)*a^2*b^3*c^3*d^2 - 9*(2*i^3*log(e) + i^3)*a^3*b^2*c^2*d^3 - 2*(3*i^3*lo
g(e) - i^3)*a^5*d^5)*B)*log(b*x + a) - 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^
4*i^3 + a^2*b^3*d^5*i^3)*B*x^3 + 4*(a*b^4*c^2*d^3*i^3 - 2*a^2*b^3*c*d^4*i^3
 + a^3*b^2*d^5*i^3)*B*x^2 + 4*(3*a*b^4*c^3*d^2*i^3 - 7*a^2*b^3*c^2*d^3*i^3
+ 5*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x + (9*a^2*b^3*c^3*d^2*i^3 - 23*a^
3*b^2*c^2*d^3*i^3 + 19*a^4*b*c*d^4*i^3 - 5*a^5*d^5*i^3)*B + 6*((b^5*c^3*d^2
*i^3 - 3*a*b^4*c^2*d^3*i^3 + 3*a^2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 +
 2*(a*b^4*c^3*d^2*i^3 - 3*a^2*b^3*c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b
*d^5*i^3)*B*x + (a^2*b^3*c^3*d^2*i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^
4*i^3 - a^5*d^5*i^3)*B)*log(b*x + a))*log(d*x + c))/(a^2*b^6*c^2*g^3 - 2*a^
3*b^5*c*d*g^3 + a^4*b^4*d^2*g^3 + (b^8*c^2*g^3 - 2*a*b^7*c*d*g^3 + a^2*b^6*
d^2*g^3)*x^2 + 2*(a*b^7*c^2*g^3 - 2*a^2*b^6*c*d*g^3 + a^3*b^5*d^2*g^3)*x) +
 3*(b*c*d^2*i^3 - a*d^3*i^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) +
1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^3i^3x^3 + 3\,Acd^2i^3x^2 + 3\,Ac^2di^3x + Ac^3i^3 + \left(Bd^3i^3x^3 + 3\,Bcd^2i^3x^2 + 3\,Bc^2di^3x + Bc^3i^3\right)\log\left(\frac{bex+ae}{dx+c}\right)}{b^3g^3x^3 + 3\,ab^2g^3x^2 + 3\,a^2bg^3x + a^3g^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algor
ithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log((b*e
*x + a*e)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*
g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{\left(bgx + ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^
3, x)
```

3.27 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=310

$$\frac{Bd^3i^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^4}-\frac{d^2i^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^4(a+bx)}-\frac{d^3i^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^4}-\frac{di^3(c+dx}{2}$$

```
[Out] -((B*d^2*i^3*(c + d*x))/(b^3*g^4*(a + b*x))) - (B*d*i^3*(c + d*x)^2)/(4*b^2
*g^4*(a + b*x)^2) - (B*i^3*(c + d*x)^3)/(9*b*g^4*(a + b*x)^3) - (d^2*i^3*(c
 + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^4*(a + b*x)) - (d*i^3*
(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^4*(a + b*x)^2) -
 (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*g^4*(a + b*x)^
3) - (d^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d
*(a + b*x))])/(b^4*g^4) + (B*d^3*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))
])/(b^4*g^4)
```

Rubi [A] time = 0.781886, antiderivative size = 424, normalized size of antiderivative = 1.37, number of steps used = 23, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^3i^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g^4}+\frac{d^3i^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^4}-\frac{3d^2i^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^4(a+bx)}-\frac{3di^3(bc-a}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^4,
x]
```

```
[Out] -(B*(b*c - a*d)^3*i^3)/(9*b^4*g^4*(a + b*x)^3) - (7*B*d*(b*c - a*d)^2*i^3)/
(12*b^4*g^4*(a + b*x)^2) - (11*B*d^2*(b*c - a*d)*i^3)/(6*b^4*g^4*(a + b*x))
 - (11*B*d^3*i^3*Log[a + b*x])/(6*b^4*g^4) - (B*d^3*i^3*Log[a + b*x]^2)/(2*
b^4*g^4) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^4*
g^4*(a + b*x)^3) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/(2*b^4*g^4*(a + b*x)^2) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(b^4*g^4*(a + b*x)) + (d^3*i^3*Log[a + b*x]*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(b^4*g^4) + (11*B*d^3*i^3*Log[c + d*x])/(6*b^4*g^4)
 + (B*d^3*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^4) + (B*d
^3*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(27c+27dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^4}\,dx=\int\left(\frac{19683(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^4(a+bx)^4}+\frac{59049d(bc-ad)^2\left(A+B\log\left(\frac{e}{-}\right.\right.}{b^3g^4(a+bx)^3}\right.$$

$$=\frac{\left(19683d^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{b^3g^4}+\frac{\left(59049d^2(bc-ad)\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}dx}{b^3g^4}+$$

$$=-\frac{6561(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^4(a+bx)^3}-\frac{59049d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{2b^4g^4(a+bx)^2}$$

$$=-\frac{6561(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^4(a+bx)^3}-\frac{59049d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{2b^4g^4(a+bx)^2}$$

$$=-\frac{6561(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^4(a+bx)^3}-\frac{59049d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{2b^4g^4(a+bx)^2}$$

$$=-\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3}-\frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2}-\frac{72171Bd^2(bc-ad)}{2b^4g^4(a+bx)}-\frac{72171Bd^3\,l}{2b^4}$$

$$=-\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3}-\frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2}-\frac{72171Bd^2(bc-ad)}{2b^4g^4(a+bx)}-\frac{72171Bd^3\,l}{2b^4}$$

$$=-\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3}-\frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2}-\frac{72171Bd^2(bc-ad)}{2b^4g^4(a+bx)}-\frac{72171Bd^3\,l}{2b^4}$$

$$=-\frac{2187B(bc-ad)^3}{b^4g^4(a+bx)^3}-\frac{45927Bd(bc-ad)^2}{4b^4g^4(a+bx)^2}-\frac{72171Bd^2(bc-ad)}{2b^4g^4(a+bx)}-\frac{72171Bd^3\,l}{2b^4}$$

Mathematica [A] time = 0.496521, size = 308, normalized size = 0.99

$$i^3\left(-18Bd^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+36d^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^4,x]
```

```
[Out] (i^3*((-4*B*(b*c - a*d)^3)/(a + b*x)^3 - (21*B*d*(b*c - a*d)^2)/(a + b*x)^2
 + (66*B*d^2*(-(b*c) + a*d))/(a + b*x) - 66*B*d^3*Log[a + b*x] - (12*(b*c -
 a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^3 - (54*d*(b*c - a*
d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (108*d^2*(-(b*c) +
 a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x) + 36*d^3*Log[a + b*x]
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 66*B*d^3*Log[c + d*x] - 18*B*d^3*(L
og[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2
, (d*(a + b*x))/(-(b*c) + a*d)])))/(36*b^4*g^4)
```

Maple [B] time = 0.067, size = 1929, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x)
```

```
[Out] -d^4*i^3/(a*d-b*c)/g^4*A/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+d^3*
i^3/(a*d-b*c)/g^4*A/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+1/2*d^4*i
^3/(a*d-b*c)/g^4*B/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*d^3*i^3/(a*d
-b*c)/g^4*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^4*i^3/(a*d-b*c)/g^4*B
/b^4*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+d^4*i^3/(a*d-b*c)/
g^4*A/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-d^3*i^3/(a*d-b*c)/g^4*A/b^3*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+d^3*i^3/(a*d-b*c)/g^4*B/b^3*dilog(-(d*(b*e/d
+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c+1/3*e^3*i^3/(a*d-b*c)/g^4*B/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/3*e^3*i^3/(a
*d-b*c)/g^4*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/9*e^3*i^3/(a*d-b*c)
/g^4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/2*e^2*d*i^3/(a*d-b*c)/g^4*
B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c
+1/2*e^2*d*i^3/(a*d-b*c)/g^4*A/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/
9*e^3*d*i^3/(a*d-b*c)/g^4*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/4*e
^2*d^2*i^3/(a*d-b*c)/g^4*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/4*
e^2*d*i^3/(a*d-b*c)/g^4*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-e*d^3*i
^3/(a*d-b*c)/g^4*A/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*d^2*i^3/(a*d
-b*c)/g^4*A/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-e*d^3*i^3/(a*d-b*c)/g
^4*B/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*d^2*i^3/(a*d-b*c)/g^4*B/b^
2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-d^4*i^3/(a*d-b*c)/g^4*B/b^4*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+d
^3*i^3/(a*d-b*c)/g^4*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-1/2*e^2*d^2*i^3/(a*d-b*c)/g^4*A/b^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/3*e^3*d*i^3/(a*d-b*c)/g^4*A/b/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-e*d^3*i^3/(a*d-b*c)/g^4*B/b^3/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+e*d^2*i^3/(a*d-b*c)
/g^4*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*c-1/3*e^3*d*i^3/(a*d-b*c)/g^4*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^2*d^2*i^3/(a*d-b*c)/g^4*B/b^2/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="maxima")
```

```
[Out] -1/6*B*d^3*i^3*((18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b^3*x^3 + 3*a*b^2*
x^2 + 3*a^2*b*x + a^3)*log(b*x + a))*log(d*x + c)/(b^7*g^4*x^3 + 3*a*b^6*g^
4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) - 6*integrate(1/6*(6*b^4*d*x^4*log(e
) + 45*a^2*b^2*d*x^2 + 38*a^3*b*d*x + 11*a^4*d + 6*(b^4*c*log(e) + 3*a*b^3*
d)*x^3 + 6*(2*b^4*d*x^4 + 6*a^2*b^2*d*x^2 + 4*a^3*b*d*x + a^4*d + (b^4*c +
4*a*b^3*d)*x^3)*log(b*x + a))/(b^8*d*g^4*x^5 + a^4*b^4*c*g^4 + (b^8*c*g^4 +
 4*a*b^7*d*g^4)*x^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b^6*d*g^4)*x^3 + 2*(3*a^2*b^
6*c*g^4 + 2*a^3*b^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^4 + a^4*b^4*d*g^4)*x), x))
- 1/6*B*c*d^2*i^3*(6*(3*b^2*x^2 + 3*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/
(d*x + c))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4)
+ (11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d +
a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c
^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^
```

```
3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x +
(a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c
*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 -
a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((
b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4)) - 1/12*B*c^2
*d*i^3*(6*(3*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^4*x^3 + 3
*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + (5*a*b^2*c^2 - 22*a^2*b*c
*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*
d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b
^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*
c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)
 - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3
*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 -
 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/18*B*c^3*i^3*((6*
b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*
x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^
4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2
)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*log(b*e*x/(d*x
 + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a
^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2
- a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^
2*c*d^2 - a^3*b*d^3)*g^4)) + 1/6*A*d^3*i^3*((18*a*b^2*x^2 + 27*a^2*b*x + 11
*a^3)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) + 6*l
og(b*x + a)/(b^4*g^4)) - 1/2*(3*b*x + a)*A*c^2*d*i^3/(b^5*g^4*x^3 + 3*a*b^4
*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - (3*b^2*x^2 + 3*a*b*x + a^2)*A*c
*d^2*i^3/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) -
1/3*A*c^3*i^3/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^3i^3x^3 + 3\,Acd^2i^3x^2 + 3\,Ac^2di^3x + Ac^3i^3 + \left(Bd^3i^3x^3 + 3\,Bcd^2i^3x^2 + 3\,Bc^2di^3x + Bc^3i^3\right)\log\left(\frac{bex+ae}{dx+c}\right)}{b^4g^4x^4 + 4\,ab^3g^4x^3 + 6\,a^2b^2g^4x^2 + 4\,a^3bg^4x + a^4g^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log((b*e
*x + a*e)/(d*x + c)))/(b^4*g^4*x^4 + 4*a*b^3*g^4*x^3 + 6*a^2*b^2*g^4*x^2 +
4*a^3*b*g^4*x + a^4*g^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{\left(bgx + ag\right)^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^
4, x)
```

3.28 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=89

$$-\frac{i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)}-\frac{Bi^3(c+dx)^4}{16g^5(a+bx)^4(bc-ad)}$$

```
[Out] -(B*i^3*(c + d*x)^4)/(16*(b*c - a*d)*g^5*(a + b*x)^4) - (i^3*(c + d*x)^4*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*(b*c - a*d)*g^5*(a + b*x)^4)
```

Rubi [B] time = 0.72228, antiderivative size = 373, normalized size of antiderivative = 4.19, number of steps used = 18, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^3i^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^5(a+bx)}-\frac{3d^2i^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^4g^5(a+bx)^2}-\frac{di^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^5(a+bx)^3}-\frac{i^3(bc-ad)^3\left(B\right.}{4b^4g^5}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^5,
x]
```

```
[Out] -(B*(b*c - a*d)^3*i^3)/(16*b^4*g^5*(a + b*x)^4) - (B*d*(b*c - a*d)^2*i^3)/(
4*b^4*g^5*(a + b*x)^3) - (3*B*d^2*(b*c - a*d)*i^3)/(8*b^4*g^5*(a + b*x)^2)
- (B*d^3*i^3)/(4*b^4*g^5*(a + b*x)) - (B*d^4*i^3*Log[a + b*x])/(4*b^4*(b*c
- a*d)*g^5) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b
^4*g^5*(a + b*x)^4) - (d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(b^4*g^5*(a + b*x)^3) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(2*b^4*g^5*(a + b*x)^2) - (d^3*i^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(b^4*g^5*(a + b*x)) + (B*d^4*i^3*Log[c + d*x])/(4*b^4*(b*c -
a*d)*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(28c+28dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^5}\,dx=\int\left(\frac{21952(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^5}+\frac{65856d(bc-ad)^2\left(A+B\log\right.}{b^3g^5(a+bx)^4}\right.$$

$$=\frac{\left(21952d^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{b^3g^5}+\frac{\left(65856d^2(bc-ad)\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{b^3g^5}$$

$$=-\frac{5488(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^5(a+bx)^4}-\frac{21952d(bc-ad)^2\left(A+B\log\left(\frac{e(\cdot}{c}\right.\right.}{b^4g^5(a+bx)^3}$$

$$=-\frac{5488(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^5(a+bx)^4}-\frac{21952d(bc-ad)^2\left(A+B\log\left(\frac{e(\cdot}{c}\right.\right.}{b^4g^5(a+bx)^3}$$

$$=-\frac{5488(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^5(a+bx)^4}-\frac{21952d(bc-ad)^2\left(A+B\log\left(\frac{e(\cdot}{c}\right.\right.}{b^4g^5(a+bx)^3}$$

$$=-\frac{1372B(bc-ad)^3}{b^4g^5(a+bx)^4}-\frac{5488Bd(bc-ad)^2}{b^4g^5(a+bx)^3}-\frac{8232Bd^2(bc-ad)}{b^4g^5(a+bx)^2}-\frac{5488Bd^3}{b^4g^5(a+b}$$

Mathematica [B] time = 0.495376, size = 427, normalized size = 4.8

$$-\frac{i^3\left(-24a^2Ab^2d^4x^2-16a^3Abd^4x-4a^4Ad^4+4B\left(-6a^2b^2d^4x^2-4a^3bd^4x-a^4d^4-4ab^3d^4x^3+b^4c\left(4c^2dx+c^3+6cd^2x\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^5,x]
```

```
[Out] -(i^3*(4*A*b^4*c^4 + b^4*B*c^4 - 4*a^4*A*d^4 - a^4*B*d^4 + 16*A*b^4*c^3*d*x
 + 4*b^4*B*c^3*d*x - 16*a^3*A*b*d^4*x - 4*a^3*b*B*d^4*x + 24*A*b^4*c^2*d^2*
x^2 + 6*b^4*B*c^2*d^2*x^2 - 24*a^2*A*b^2*d^4*x^2 - 6*a^2*b^2*B*d^4*x^2 + 16
*A*b^4*c*d^3*x^3 + 4*b^4*B*c*d^3*x^3 - 16*a*A*b^3*d^4*x^3 - 4*a*b^3*B*d^4*x
^3 + 4*B*d^4*(a + b*x)^4*Log[a + b*x] + 4*B*(-(a^4*d^4) - 4*a^3*b*d^4*x - 6
*a^2*b^2*d^4*x^2 - 4*a*b^3*d^4*x^3 + b^4*c*(c^3 + 4*c^2*d*x + 6*c*d^2*x^2 +
 4*d^3*x^3))*Log[(e*(a + b*x))/(c + d*x)] - 4*a^4*B*d^4*Log[c + d*x] - 16*a
^3*b*B*d^4*x*Log[c + d*x] - 24*a^2*b^2*B*d^4*x^2*Log[c + d*x] - 16*a*b^3*B*
d^4*x^3*Log[c + d*x] - 4*b^4*B*d^4*x^4*Log[c + d*x]))/(16*b^4*(b*c - a*d)*g
^5*(a + b*x)^4)
```

Maple [B] time = 0.052, size = 406, normalized size = 4.6

$$\frac{e^4di^3Aa}{4\left(ad-bc\right)^2g^5}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)\,d}\right)^{-4}-\frac{e^4i^3Abc}{4\left(ad-bc\right)^2g^5}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)\,d}\right)^{-4}+\frac{e^4di^3Ba}{4\left(ad-bc\right)^2g^5}\ln\left(\frac{be}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x)
```

```
[Out] 1/4*e^4*d*i^3/(a*d-b*c)^2/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/4
*e^4*i^3/(a*d-b*c)^2/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c+1/4*e^
4*d*i^3/(a*d-b*c)^2/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*a-1/4*e^4*i^3/(a*d-b*c)^2/g^5*B/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/16*e^4*d*i^3/(a*d-b*c
)^2/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/16*e^4*i^3/(a*d-b*c)^2/
g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c
```

Maxima [B] time = 1.99735, size = 4194, normalized size = 47.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="maxima")
```

```
[Out] -1/48*B*d^3*i^3*(12*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*log(b*e*x/(
d*x + c) + a*e/(d*x + c))/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^
2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + (25*a^3*b^3*c^3 - 23*a^4*b^2*c^2*d + 1
3*a^5*b*c*d^2 - 3*a^6*d^3 + 12*(4*b^6*c^3 - 6*a*b^5*c^2*d + 4*a^2*b^4*c*d^2
 - a^3*b^3*d^3)*x^3 + 6*(18*a*b^5*c^3 - 22*a^2*b^4*c^2*d + 13*a^3*b^3*c*d^2
 - 3*a^4*b^2*d^3)*x^2 + 4*(22*a^2*b^4*c^3 - 23*a^3*b^3*c^2*d + 13*a^4*b^2*c
*d^2 - 3*a^5*b*d^3)*x)/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*
b^8*d^3)*g^5*x^4 + 4*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*
b^7*d^3)*g^5*x^3 + 6*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5
*b^6*d^3)*g^5*x^2 + 4*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^
6*b^5*d^3)*g^5*x + (a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b
^4*d^3)*g^5) + 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)
*log(b*x + a)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d
^3 + a^4*b^4*d^4)*g^5) - 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3
- a^3*d^4)*log(d*x + c)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a
^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5)) - 1/48*B*c*d^2*i^3*(12*(6*b^2*x^2 + 4*a*b
*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x
^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 -
 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*
c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2
 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d
^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7
*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*
d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5
*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^
4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d
^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^
4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)
 + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*
b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/48
*B*c^2*d*i^3*(12*(4*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*
x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5)
+ (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4
*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*
x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/(
(b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^
```

```
8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b
^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*
b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5
*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^
3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a
^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^
6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*
g^5)) + 1/48*B*c^3*i^3*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a
^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d -
5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^
2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2
 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^
2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d
^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2
- a^7*b*d^3)*g^5) - 12*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4 +
4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4
*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d
^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^
2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*(4*b*x + a)*A*c^2*
d*i^3/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x
+ a^4*b^2*g^5) - 1/4*(6*b^2*x^2 + 4*a*b*x + a^2)*A*c*d^2*i^3/(b^7*g^5*x^4 +
 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/4
*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*A*d^3*i^3/(b^8*g^5*x^4 + 4*a*b
^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) - 1/4*A*c^3
*i^3/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x +
 a^4*b*g^5)
```

Fricas [B] time = 0.542133, size = 710, normalized size = 7.98

$$-\frac{4\left(\left((4A+B)b^4cd^3-(4A+B)ab^3d^4\right)i^3x^3+6\left((4A+B)b^4c^2d^2-(4A+B)a^2b^2d^4\right)i^3x^2+4\left((4A+B)b^4c^3d-(4A+\cdots\right.\right.}{16\left(\left(b^9c-ab^8d\right)g^5x^4+4\left(ab^8c-a^2b^7d\right)g^5x^3+6\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="fricas")
```

```
[Out] -1/16*(4*((4*A + B)*b^4*c*d^3 - (4*A + B)*a*b^3*d^4)*i^3*x^3 + 6*((4*A + B)
*b^4*c^2*d^2 - (4*A + B)*a^2*b^2*d^4)*i^3*x^2 + 4*((4*A + B)*b^4*c^3*d - (4
*A + B)*a^3*b*d^4)*i^3*x + ((4*A + B)*b^4*c^4 - (4*A + B)*a^4*d^4)*i^3 + 4*
(B*b^4*d^4*i^3*x^4 + 4*B*b^4*c*d^3*i^3*x^3 + 6*B*b^4*c^2*d^2*i^3*x^2 + 4*B*
b^4*c^3*d*i^3*x + B*b^4*c^4*i^3)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c - a*
b^8*d)*g^5*x^4 + 4*(a*b^8*c - a^2*b^7*d)*g^5*x^3 + 6*(a^2*b^7*c - a^3*b^6*d
)*g^5*x^2 + 4*(a^3*b^6*c - a^4*b^5*d)*g^5*x + (a^4*b^5*c - a^5*b^4*d)*g^5)
```

Sympy [B] time = 157.452, size = 864, normalized size = 9.71

$$-\frac{Bd^4i^3\log\left(x+\frac{-\frac{Ba^2d^6i^3}{ad-bc}+\frac{2Babcd^5i^3}{ad-bc}+Bad^5i^3-\frac{Bb^2c^2d^4i^3}{ad-bc}+Bbcd^4i^3}{2Bbd^5i^3}\right)}{4b^4g^5(ad-bc)}+\frac{Bd^4i^3\log\left(x+\frac{\frac{Ba^2d^6i^3}{ad-bc}-\frac{2Babcd^5i^3}{ad-bc}+Bad^5i^3+\frac{Bb^2c^2d^4i^3}{ad-bc}+Bbcd^4i^3}{2Bbd^5i^3}\right)}{4b^4g^5(ad-bc)}-\frac{4Aa^3\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*d**4*i**3*log(x + (-B*a**2*d**6*i**3/(a*d - b*c) + 2*B*a*b*c*d**5*i**3/(
a*d - b*c) + B*a*d**5*i**3 - B*b**2*c**2*d**4*i**3/(a*d - b*c) + B*b*c*d**4
*i**3)/(2*B*b*d**5*i**3))/(4*b**4*g**5*(a*d - b*c)) + B*d**4*i**3*log(x + (
B*a**2*d**6*i**3/(a*d - b*c) - 2*B*a*b*c*d**5*i**3/(a*d - b*c) + B*a*d**5*i
**3 + B*b**2*c**2*d**4*i**3/(a*d - b*c) + B*b*c*d**4*i**3)/(2*B*b*d**5*i**3
))/(4*b**4*g**5*(a*d - b*c)) - (4*A*a**3*d**3*i**3 + 4*A*a**2*b*c*d**2*i**3
 + 4*A*a*b**2*c**2*d*i**3 + 4*A*b**3*c**3*i**3 + B*a**3*d**3*i**3 + B*a**2*
b*c*d**2*i**3 + B*a*b**2*c**2*d*i**3 + B*b**3*c**3*i**3 + x**3*(16*A*b**3*d
**3*i**3 + 4*B*b**3*d**3*i**3) + x**2*(24*A*a*b**2*d**3*i**3 + 24*A*b**3*c*
d**2*i**3 + 6*B*a*b**2*d**3*i**3 + 6*B*b**3*c*d**2*i**3) + x*(16*A*a**2*b*d
**3*i**3 + 16*A*a*b**2*c*d**2*i**3 + 16*A*b**3*c**2*d*i**3 + 4*B*a**2*b*d**
3*i**3 + 4*B*a*b**2*c*d**2*i**3 + 4*B*b**3*c**2*d*i**3))/(16*a**4*b**4*g**5
 + 64*a**3*b**5*g**5*x + 96*a**2*b**6*g**5*x**2 + 64*a*b**7*g**5*x**3 + 16*
b**8*g**5*x**4) + (-B*a**3*d**3*i**3 - B*a**2*b*c*d**2*i**3 - 4*B*a**2*b*d*
*3*i**3*x - B*a*b**2*c**2*d*i**3 - 4*B*a*b**2*c*d**2*i**3*x - 6*B*a*b**2*d*
*3*i**3*x**2 - B*b**3*c**3*i**3 - 4*B*b**3*c**2*d*i**3*x - 6*B*b**3*c*d**2*
i**3*x**2 - 4*B*b**3*d**3*i**3*x**3)*log(e*(a + b*x)/(c + d*x))/(4*a**4*b**
4*g**5 + 16*a**3*b**5*g**5*x + 24*a**2*b**6*g**5*x**2 + 16*a*b**7*g**5*x**3
 + 4*b**8*g**5*x**4)
```

Giac [B] time = 1.32788, size = 776, normalized size = 8.72

$$-\frac{Bd^4 \log(bx+a)}{4\left(b^5cg^5i - ab^4dg^5i\right)} + \frac{Bd^4 \log(dx+c)}{4\left(b^5cg^5i - ab^4dg^5i\right)} + \frac{\left(4\,Bb^3d^3ix^3 + 6\,Bb^3cd^2ix^2 + 6\,Bab^2d^3ix^2 + 4\,Bb^3c^2dix + 4\,Bab^2cd^2ix + 4\right.}{4\left(b^8g^5x^4 + 4\,ab^7g^5x^3 + 6\,a^2b^6g^5x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algor
ithm="giac")
```

```
[Out] -1/4*B*d^4*log(b*x + a)/(b^5*c*g^5*i - a*b^4*d*g^5*i) + 1/4*B*d^4*log(d*x +
 c)/(b^5*c*g^5*i - a*b^4*d*g^5*i) + 1/4*(4*B*b^3*d^3*i*x^3 + 6*B*b^3*c*d^2*
i*x^2 + 6*B*a*b^2*d^3*i*x^2 + 4*B*b^3*c^2*d*i*x + 4*B*a*b^2*c*d^2*i*x + 4*B
*a^2*b*d^3*i*x + B*b^3*c^3*i + B*a*b^2*c^2*d*i + B*a^2*b*c*d^2*i + B*a^3*d^
3*i)*log((b*x + a)/(d*x + c))/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^
5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + 1/16*(16*A*b^3*d^3*i*x^3 + 20*B*b^
3*d^3*i*x^3 + 24*A*b^3*c*d^2*i*x^2 + 30*B*b^3*c*d^2*i*x^2 + 24*A*a*b^2*d^3*
i*x^2 + 30*B*a*b^2*d^3*i*x^2 + 16*A*b^3*c^2*d*i*x + 20*B*b^3*c^2*d*i*x + 16
*A*a*b^2*c*d^2*i*x + 20*B*a*b^2*c*d^2*i*x + 16*A*a^2*b*d^3*i*x + 20*B*a^2*b
*d^3*i*x + 4*A*b^3*c^3*i + 5*B*b^3*c^3*i + 4*A*a*b^2*c^2*d*i + 5*B*a*b^2*c^
2*d*i + 4*A*a^2*b*c*d^2*i + 5*B*a^2*b*c*d^2*i + 4*A*a^3*d^3*i + 5*B*a^3*d^3
*i)/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x +
a^4*b^4*g^5)
```

3.29 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=181

$$-\frac{bi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5g^6(a+bx)^5(bc-ad)^2}+\frac{di^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^6(a+bx)^4(bc-ad)^2}-\frac{bBi^3(c+dx)^5}{25g^6(a+bx)^5(bc-ad)^2}+\frac{Bdi^3(c+dx}{16g^6(a+bx)^4(bc}$$

```
[Out] (B*d*i^3*(c + d*x)^4)/(16*(b*c - a*d)^2*g^6*(a + b*x)^4) - (b*B*i^3*(c + d*
x)^5)/(25*(b*c - a*d)^2*g^6*(a + b*x)^5) + (d*i^3*(c + d*x)^4*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(4*(b*c - a*d)^2*g^6*(a + b*x)^4) - (b*i^3*(c + d*
x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*(b*c - a*d)^2*g^6*(a + b*x)^5
)
```

Rubi [B] time = 0.865167, antiderivative size = 409, normalized size of antiderivative = 2.26, number of steps used = 18, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^3i^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^4g^6(a+bx)^2}-\frac{d^2i^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^6(a+bx)^3}-\frac{3di^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^4g^6(a+bx)^4}-\frac{i^3(bc-ad)^3}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^6,
x]
```

```
[Out] -(B*(b*c - a*d)^3*i^3)/(25*b^4*g^6*(a + b*x)^5) - (11*B*d*(b*c - a*d)^2*i^3
)/(80*b^4*g^6*(a + b*x)^4) - (3*B*d^2*(b*c - a*d)*i^3)/(20*b^4*g^6*(a + b*x
)^3) - (B*d^3*i^3)/(40*b^4*g^6*(a + b*x)^2) + (B*d^4*i^3)/(20*b^4*(b*c - a*
d)*g^6*(a + b*x)) + (B*d^5*i^3*Log[a + b*x])/(20*b^4*(b*c - a*d)^2*g^6) - (
(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b^4*g^6*(a + b*x
)^5) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b^4*
g^6*(a + b*x)^4) - (d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(b^4*g^6*(a + b*x)^3) - (d^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
2*b^4*g^6*(a + b*x)^2) - (B*d^5*i^3*Log[c + d*x])/(20*b^4*(b*c - a*d)^2*g^6
)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(29c+29dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^6}\,dx = \int\left(\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^6(a+bx)^6}+\frac{73167d(bc-ad)^2\left(A+B\log\left(\frac{e}{}\right.\right.}{b^3g^6(a+bx)^5}\right.$$

$$=\frac{\left(24389d^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{b^3g^6}+\frac{\left(73167d^2(bc-ad)\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{b^3g^6}+\frac{(}{}$$

$$=-\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^4g^6(a+bx)^5}-\frac{73167d(bc-ad)^2\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{4b^4g^6(a+bx)^4}$$

$$=-\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^4g^6(a+bx)^5}-\frac{73167d(bc-ad)^2\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{4b^4g^6(a+bx)^4}$$

$$=-\frac{24389(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b^4g^6(a+bx)^5}-\frac{73167d(bc-ad)^2\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{4b^4g^6(a+bx)^4}$$

$$=-\frac{24389B(bc-ad)^3}{25b^4g^6(a+bx)^5}-\frac{268279Bd(bc-ad)^2}{80b^4g^6(a+bx)^4}-\frac{73167Bd^2(bc-ad)}{20b^4g^6(a+bx)^3}-\frac{2438}{40b^4g^6(a}$$

Mathematica [B] time = 0.621215, size = 608, normalized size = 3.36

$$-\frac{i^3\left(200a^2Ab^3d^5x^3+200a^3Ab^2d^5x^2+100a^4Abd^5x+20a^5Ad^5+20B(bc-ad)^2\left(a^2bd^2(2c+5dx)+a^3d^3+ab^2d\left(3c^2+1\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^6,x]
```

```
[Out] -(i^3*(80*A*b^5*c^5 + 16*b^5*B*c^5 - 100*a*A*b^4*c^4*d - 25*a*b^4*B*c^4*d +
 20*a^5*A*d^5 + 9*a^5*B*d^5 + 300*A*b^5*c^4*d*x + 55*b^5*B*c^4*d*x - 400*a*
A*b^4*c^3*d^2*x - 100*a*b^4*B*c^3*d^2*x + 100*a^4*A*b*d^5*x + 45*a^4*b*B*d^
5*x + 400*A*b^5*c^3*d^2*x^2 + 60*b^5*B*c^3*d^2*x^2 - 600*a*A*b^4*c^2*d^3*x^
2 - 150*a*b^4*B*c^2*d^3*x^2 + 200*a^3*A*b^2*d^5*x^2 + 90*a^3*b^2*B*d^5*x^2
+ 200*A*b^5*c^2*d^3*x^3 + 10*b^5*B*c^2*d^3*x^3 - 400*a*A*b^4*c*d^4*x^3 - 10
0*a*b^4*B*c*d^4*x^3 + 200*a^2*A*b^3*d^5*x^3 + 90*a^2*b^3*B*d^5*x^3 - 20*b^5
*B*c*d^4*x^4 + 20*a*b^4*B*d^5*x^4 - 20*B*d^5*(a + b*x)^5*Log[a + b*x] + 20*
B*(b*c - a*d)^2*(a^3*d^3 + a^2*b*d^2*(2*c + 5*d*x) + a*b^2*d*(3*c^2 + 10*c*
d*x + 10*d^2*x^2) + b^3*(4*c^3 + 15*c^2*d*x + 20*c*d^2*x^2 + 10*d^3*x^3))*L
og[(e*(a + b*x))/(c + d*x)] + 20*a^5*B*d^5*Log[c + d*x] + 100*a^4*b*B*d^5*x
*Log[c + d*x] + 200*a^3*b^2*B*d^5*x^2*Log[c + d*x] + 200*a^2*b^3*B*d^5*x^3*
Log[c + d*x] + 100*a*b^4*B*d^5*x^4*Log[c + d*x] + 20*b^5*B*d^5*x^5*Log[c +
d*x]))/(400*b^4*(b*c - a*d)^2*g^6*(a + b*x)^5)
```

Maple [B] time = 0.049, size = 828, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x)
```

```
[Out] 1/4*e^4*d^2*i^3/(a*d-b*c)^3/g^6*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1
/4*e^4*d*i^3/(a*d-b*c)^3/g^6*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c-1/
5*e^5*d*i^3/(a*d-b*c)^3/g^6*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+1/5
*e^5*i^3/(a*d-b*c)^3/g^6*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c+1/4*
e^4*d^2*i^3/(a*d-b*c)^3/g^6*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*a-1/4*e^4*d*i^3/(a*d-b*c)^3/g^6*B/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/16*e^4*d^2*i^3/
(a*d-b*c)^3/g^6*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/16*e^4*d*i^3/(a
*d-b*c)^3/g^6*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c-1/5*e^5*d*i^3/(a*
d-b*c)^3/g^6*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*a+1/5*e^5*i^3/(a*d-b*c)^3/g^6*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/25*e^5*d*i^3/(a*d-b*c)^3/g^6
*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+1/25*e^5*i^3/(a*d-b*c)^3/g^6*B
*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c
```

Maxima [B] time = 2.5098, size = 5694, normalized size = 31.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="maxima")
```

```
[Out] -1/1200*B*d^3*i^3*(60*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*log(b*e
*x/(d*x + c) + a*e/(d*x + c))/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g
^6*x^3 + 10*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) + (77*a^3*b^4*
c^4 - 548*a^4*b^3*c^3*d + 352*a^5*b^2*c^2*d^2 - 148*a^6*b*c*d^3 + 27*a^7*d^
4 - 60*(10*b^7*c^3*d - 10*a*b^6*c^2*d^2 + 5*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^
4 + 30*(10*b^7*c^4 - 100*a*b^6*c^3*d + 95*a^2*b^5*c^2*d^2 - 46*a^3*b^4*c*d^
3 + 9*a^4*b^3*d^4)*x^3 + 10*(50*a*b^6*c^4 - 410*a^2*b^5*c^3*d + 337*a^3*b^4
*c^2*d^2 - 148*a^4*b^3*c*d^3 + 27*a^5*b^2*d^4)*x^2 + 5*(65*a^2*b^5*c^4 - 48
8*a^3*b^4*c^3*d + 352*a^4*b^3*c^2*d^2 - 148*a^5*b^2*c*d^3 + 27*a^6*b*d^4)*x
)/((b^13*c^4 - 4*a*b^12*c^3*d + 6*a^2*b^11*c^2*d^2 - 4*a^3*b^10*c*d^3 + a^4
*b^9*d^4)*g^6*x^5 + 5*(a*b^12*c^4 - 4*a^2*b^11*c^3*d + 6*a^3*b^10*c^2*d^2 -
 4*a^4*b^9*c*d^3 + a^5*b^8*d^4)*g^6*x^4 + 10*(a^2*b^11*c^4 - 4*a^3*b^10*c^3
*d + 6*a^4*b^9*c^2*d^2 - 4*a^5*b^8*c*d^3 + a^6*b^7*d^4)*g^6*x^3 + 10*(a^3*b
^10*c^4 - 4*a^4*b^9*c^3*d + 6*a^5*b^8*c^2*d^2 - 4*a^6*b^7*c*d^3 + a^7*b^6*d
^4)*g^6*x^2 + 5*(a^4*b^9*c^4 - 4*a^5*b^8*c^3*d + 6*a^6*b^7*c^2*d^2 - 4*a^7*
b^6*c*d^3 + a^8*b^5*d^4)*g^6*x + (a^5*b^8*c^4 - 4*a^6*b^7*c^3*d + 6*a^7*b^6
*c^2*d^2 - 4*a^8*b^5*c*d^3 + a^9*b^4*d^4)*g^6) - 60*(10*b^3*c^3*d^2 - 10*a*
b^2*c^2*d^3 + 5*a^2*b*c*d^4 - a^3*d^5)*log(b*x + a)/((b^9*c^5 - 5*a*b^8*c^4
*d + 10*a^2*b^7*c^3*d^2 - 10*a^3*b^6*c^2*d^3 + 5*a^4*b^5*c*d^4 - a^5*b^4*d^
5)*g^6) + 60*(10*b^3*c^3*d^2 - 10*a*b^2*c^2*d^3 + 5*a^2*b*c*d^4 - a^3*d^5)*
log(d*x + c)/((b^9*c^5 - 5*a*b^8*c^4*d + 10*a^2*b^7*c^3*d^2 - 10*a^3*b^6*c^
2*d^3 + 5*a^4*b^5*c*d^4 - a^5*b^4*d^5)*g^6)) - 1/600*B*c*d^2*i^3*(60*(10*b^
2*x^2 + 5*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^8*g^6*x^5 +
```

5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + (47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6)) - 1/400*B*c^2*d*i^3*(60*(5*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) + (27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) - 1/300*B*c^3*i^3*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6)) - 3/20*(5*b*x + a)*A*c^2*d*i^3/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) - 1/10*(10*b^2*x^2 + 5*a*b*x + a^2)*A*c*d^2*i^3/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1/20*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*A*d^3*i^3/(b^9*g^6*x^5 + 5*a*b^8*g^6*x

```
^4 + 10*a^2*b^7*g^6*x^3 + 10*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^
6) - 1/5*A*c^3*i^3/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10
*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6)
```

Fricas [B] time = 0.52562, size = 1337, normalized size = 7.39

$$\frac{20\left(Bb^5cd^4 - Bab^4d^5\right)i^3x^4 - 10\left((20A + B)b^5c^2d^3 - 10(4A + B)ab^4cd^4 + (20A + 9B)a^2b^3d^5\right)i^3x^3 - 10\left(2(20A + 3B\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="fricas")
```

```
[Out] 1/400*(20*(B*b^5*c*d^4 - B*a*b^4*d^5)*i^3*x^4 - 10*((20*A + B)*b^5*c^2*d^3
- 10*(4*A + B)*a*b^4*c*d^4 + (20*A + 9*B)*a^2*b^3*d^5)*i^3*x^3 - 10*(2*(20*
A + 3*B)*b^5*c^3*d^2 - 15*(4*A + B)*a*b^4*c^2*d^3 + (20*A + 9*B)*a^3*b^2*d^
5)*i^3*x^2 - 5*((60*A + 11*B)*b^5*c^4*d - 20*(4*A + B)*a*b^4*c^3*d^2 + (20*
A + 9*B)*a^4*b*d^5)*i^3*x - (16*(5*A + B)*b^5*c^5 - 25*(4*A + B)*a*b^4*c^4*
d + (20*A + 9*B)*a^5*d^5)*i^3 + 20*(B*b^5*d^5*i^3*x^5 + 5*B*a*b^4*d^5*i^3*x
^4 - 10*(B*b^5*c^2*d^3 - 2*B*a*b^4*c*d^4)*i^3*x^3 - 10*(2*B*b^5*c^3*d^2 - 3
*B*a*b^4*c^2*d^3)*i^3*x^2 - 5*(3*B*b^5*c^4*d - 4*B*a*b^4*c^3*d^2)*i^3*x - (
4*B*b^5*c^5 - 5*B*a*b^4*c^4*d)*i^3)*log((b*e*x + a*e)/(d*x + c)))/((b^11*c^
2 - 2*a*b^10*c*d + a^2*b^9*d^2)*g^6*x^5 + 5*(a*b^10*c^2 - 2*a^2*b^9*c*d + a
^3*b^8*d^2)*g^6*x^4 + 10*(a^2*b^9*c^2 - 2*a^3*b^8*c*d + a^4*b^7*d^2)*g^6*x^
3 + 10*(a^3*b^8*c^2 - 2*a^4*b^7*c*d + a^5*b^6*d^2)*g^6*x^2 + 5*(a^4*b^7*c^2
 - 2*a^5*b^6*c*d + a^6*b^5*d^2)*g^6*x + (a^5*b^6*c^2 - 2*a^6*b^5*c*d + a^7*
b^4*d^2)*g^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.37452, size = 1183, normalized size = 6.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algor
ithm="giac")
```

```
[Out] 1/20*B*d^5*log(b*x + a)/(b^6*c^2*g^6*i - 2*a*b^5*c*d*g^6*i + a^2*b^4*d^2*g^
6*i) - 1/20*B*d^5*log(d*x + c)/(b^6*c^2*g^6*i - 2*a*b^5*c*d*g^6*i + a^2*b^4
*d^2*g^6*i) + 1/20*(10*B*b^3*d^3*i*x^3 + 20*B*b^3*c*d^2*i*x^2 + 10*B*a*b^2*
```

```
d^3*i*x^2 + 15*B*b^3*c^2*d*i*x + 10*B*a*b^2*c*d^2*i*x + 5*B*a^2*b*d^3*i*x +
 4*B*b^3*c^3*i + 3*B*a*b^2*c^2*d*i + 2*B*a^2*b*c*d^2*i + B*a^3*d^3*i)*log((
b*x + a)/(d*x + c))/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x^3 + 1
0*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) - 1/400*(20*B*b^4*d^4*i*
x^4 - 200*A*b^4*c*d^3*i*x^3 - 210*B*b^4*c*d^3*i*x^3 + 200*A*a*b^3*d^4*i*x^3
 + 290*B*a*b^3*d^4*i*x^3 - 400*A*b^4*c^2*d^2*i*x^2 - 460*B*b^4*c^2*d^2*i*x^
2 + 200*A*a*b^3*c*d^3*i*x^2 + 290*B*a*b^3*c*d^3*i*x^2 + 200*A*a^2*b^2*d^4*i
*x^2 + 290*B*a^2*b^2*d^4*i*x^2 - 300*A*b^4*c^3*d*i*x - 355*B*b^4*c^3*d*i*x
+ 100*A*a*b^3*c^2*d^2*i*x + 145*B*a*b^3*c^2*d^2*i*x + 100*A*a^2*b^2*c*d^3*i
*x + 145*B*a^2*b^2*c*d^3*i*x + 100*A*a^3*b*d^4*i*x + 145*B*a^3*b*d^4*i*x -
80*A*b^4*c^4*i - 96*B*b^4*c^4*i + 20*A*a*b^3*c^3*d*i + 29*B*a*b^3*c^3*d*i +
 20*A*a^2*b^2*c^2*d^2*i + 29*B*a^2*b^2*c^2*d^2*i + 20*A*a^3*b*c*d^3*i + 29*
B*a^3*b*c*d^3*i + 20*A*a^4*d^4*i + 29*B*a^4*d^4*i)/(b^10*c*g^6*x^5 - a*b^9*
d*g^6*x^5 + 5*a*b^9*c*g^6*x^4 - 5*a^2*b^8*d*g^6*x^4 + 10*a^2*b^8*c*g^6*x^3
- 10*a^3*b^7*d*g^6*x^3 + 10*a^3*b^7*c*g^6*x^2 - 10*a^4*b^6*d*g^6*x^2 + 5*a^
4*b^6*c*g^6*x - 5*a^5*b^5*d*g^6*x + a^5*b^5*c*g^6 - a^6*b^4*d*g^6)
```

3.30 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^7}\,dx$

Optimal. Leaf size=281

$$-\frac{b^2i^3(c+dx)^6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6g^7(a+bx)^6(bc-ad)^3}-\frac{d^2i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g^7(a+bx)^4(bc-ad)^3}+\frac{2bdi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5g^7(a+bx)^5(bc-ad)^3}-\frac{}{36}$$

```
[Out] -(B*d^2*i^3*(c + d*x)^4)/(16*(b*c - a*d)^3*g^7*(a + b*x)^4) + (2*b*B*d*i^3*
(c + d*x)^5)/(25*(b*c - a*d)^3*g^7*(a + b*x)^5) - (b^2*B*i^3*(c + d*x)^6)/(
36*(b*c - a*d)^3*g^7*(a + b*x)^6) - (d^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/(4*(b*c - a*d)^3*g^7*(a + b*x)^4) + (2*b*d*i^3*(c + d*x
)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*(b*c - a*d)^3*g^7*(a + b*x)^5)
 - (b^2*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*(b*c - a*d
)^3*g^7*(a + b*x)^6)
```

Rubi [A] time = 0.975718, antiderivative size = 445, normalized size of antiderivative = 1.58, number of steps used = 18, number of rules used = 4, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^3i^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^4g^7(a+bx)^3}-\frac{3d^2i^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b^4g^7(a+bx)^4}-\frac{3di^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b^4g^7(a+bx)^5}-\frac{i^3(bc-ad)}{6}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x)^7,
x]
```

```
[Out] -(B*(b*c - a*d)^3*i^3)/(36*b^4*g^7*(a + b*x)^6) - (13*B*d*(b*c - a*d)^2*i^3
)/(150*b^4*g^7*(a + b*x)^5) - (19*B*d^2*(b*c - a*d)*i^3)/(240*b^4*g^7*(a +
b*x)^4) - (B*d^3*i^3)/(180*b^4*g^7*(a + b*x)^3) + (B*d^4*i^3)/(120*b^4*(b*c
 - a*d)*g^7*(a + b*x)^2) - (B*d^5*i^3)/(60*b^4*(b*c - a*d)^2*g^7*(a + b*x))
 - (B*d^6*i^3*Log[a + b*x])/(60*b^4*(b*c - a*d)^3*g^7) - ((b*c - a*d)^3*i^3
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b^4*g^7*(a + b*x)^6) - (3*d*(b*c
- a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b^4*g^7*(a + b*x)^5)
- (3*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b^4*g^7*(
a + b*x)^4) - (d^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^4*g^7*(a
+ b*x)^3) + (B*d^6*i^3*Log[c + d*x])/(60*b^4*(b*c - a*d)^3*g^7)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(30c+30dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ag+bgx)^7}\,dx = \int\left(\frac{27000(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^7(a+bx)^7}+\frac{81000d(bc-ad)^2\left(A+B\log\left(\frac{e}{\cdot}\right.\right.}{b^3g^7(a+bx)^6}\right.$$

$$=\frac{\left(27000d^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{b^3g^7}+\frac{\left(81000d^2(bc-ad)\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5}\,dx}{b^3g^7}+$$

$$=-\frac{4500(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^7(a+bx)^6}-\frac{16200d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^4g^7(a+bx)^5}$$

$$=-\frac{4500(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^7(a+bx)^6}-\frac{16200d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^4g^7(a+bx)^5}$$

$$=-\frac{4500(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^7(a+bx)^6}-\frac{16200d(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^4g^7(a+bx)^5}$$

$$=-\frac{750B(bc-ad)^3}{b^4g^7(a+bx)^6}-\frac{2340Bd(bc-ad)^2}{b^4g^7(a+bx)^5}-\frac{4275Bd^2(bc-ad)}{2b^4g^7(a+bx)^4}-\frac{150Bd^3}{b^4g^7(a+bx)^3}$$

Mathematica [B] time = 1.09176, size = 642, normalized size = 2.28

$$\frac{i^3\left(1200d^3(a+bx)^3(ad-bc)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-2700d^2(a+bx)^2(bc-ad)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2160d(a+bx)(ad\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g
*x)^7,x]
```

```
[Out] (i^3*(-100*B*(b*c - a*d)^6 + 432*a*B*d*(-(b*c) + a*d)^5 - 432*b*B*d*(b*c -
a*d)^5*x + 540*a*B*d^2*(b*c - a*d)^4*(a + b*x) + 120*B*d*(b*c - a*d)^5*(a +
 b*x) + 540*b*B*d^2*(b*c - a*d)^4*x*(a + b*x) - 825*B*d^2*(b*c - a*d)^4*(a
+ b*x)^2 + 720*a*B*d^3*(-(b*c) + a*d)^3*(a + b*x)^2 - 720*b*B*d^3*(b*c - a*
d)^3*x*(a + b*x)^2 + 1080*a*B*d^4*(b*c - a*d)^2*(a + b*x)^3 + 700*B*d^3*(b*
c - a*d)^3*(a + b*x)^3 + 1080*b*B*d^4*(b*c - a*d)^2*x*(a + b*x)^3 - 1050*B*
d^4*(b*c - a*d)^2*(a + b*x)^4 + 2160*a*B*d^5*(-(b*c) + a*d)*(a + b*x)^4 - 2
160*b*B*d^5*(b*c - a*d)*x*(a + b*x)^4 + 2100*B*d^5*(b*c - a*d)*(a + b*x)^5
- 2160*a*B*d^6*(a + b*x)^5*Log[a + b*x] - 2160*b*B*d^6*x*(a + b*x)^5*Log[a
+ b*x] + 2100*B*d^6*(a + b*x)^6*Log[a + b*x] - 600*(b*c - a*d)^6*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) + 2160*d*(-(b*c) + a*d)^5*(a + b*x)*(A + B*Log[(
e*(a + b*x))/(c + d*x)]) - 2700*d^2*(b*c - a*d)^4*(a + b*x)^2*(A + B*Log[(e
*(a + b*x))/(c + d*x)]) + 1200*d^3*(-(b*c) + a*d)^3*(a + b*x)^3*(A + B*Log[
```

```
(e*(a + b*x))/(c + d*x)]) + 2160*a*B*d^6*(a + b*x)^5*Log[c + d*x] + 2160*b*
B*d^6*x*(a + b*x)^5*Log[c + d*x] - 2100*B*d^6*(a + b*x)^6*Log[c + d*x]))/(3
600*b^4*(b*c - a*d)^3*g^7*(a + b*x)^6)
```

Maple [B] time = 0.053, size = 1262, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x)
```

```
[Out] 1/4*e^4*d^3*i^3/(a*d-b*c)^4/g^7*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1
/4*e^4*d^2*i^3/(a*d-b*c)^4/g^7*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c-
2/5*e^5*d^2*i^3/(a*d-b*c)^4/g^7*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a
+2/5*e^5*d*i^3/(a*d-b*c)^4/g^7*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*
c+1/6*e^6*d*i^3/(a*d-b*c)^4/g^7*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6
*a-1/6*e^6*i^3/(a*d-b*c)^4/g^7*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*
c+1/4*e^4*d^3*i^3/(a*d-b*c)^4/g^7*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/4*e^4*d^2*i^3/(a*d-b*c)^4/g^7*B/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/16*e^4*
d^3*i^3/(a*d-b*c)^4/g^7*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/16*e^4*
d^2*i^3/(a*d-b*c)^4/g^7*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c-2/5*e^5
*d^2*i^3/(a*d-b*c)^4/g^7*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*a+2/5*e^5*d*i^3/(a*d-b*c)^4/g^7*B*b^2/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/25*e^5*d^2*i^3
/(a*d-b*c)^4/g^7*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+2/25*e^5*d*i^3
/(a*d-b*c)^4/g^7*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c+1/6*e^6*d*i^
3/(a*d-b*c)^4/g^7*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*a-1/6*e^6*i^3/(a*d-b*c)^4/g^7*B*b^3/(b*e/d+e/(d*x+c)*a-e
/d/(d*x+c)*b*c)^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/36*e^6*d*i^3/(a*d-b*c
)^4/g^7*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*a-1/36*e^6*i^3/(a*d-b*c
)^4/g^7*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*c
```

Maxima [B] time = 3.32622, size = 7457, normalized size = 26.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x, algor
ithm="maxima")
```

```
[Out] -1/3600*B*d^3*i^3*(60*(20*b^3*x^3 + 15*a*b^2*x^2 + 6*a^2*b*x + a^3)*log(b*e
*x/(d*x + c) + a*e/(d*x + c))/(b^10*g^7*x^6 + 6*a*b^9*g^7*x^5 + 15*a^2*b^8*
g^7*x^4 + 20*a^3*b^7*g^7*x^3 + 15*a^4*b^6*g^7*x^2 + 6*a^5*b^5*g^7*x + a^6*b
^4*g^7) + (57*a^3*b^5*c^5 - 405*a^4*b^4*c^4*d + 1470*a^5*b^3*c^3*d^2 - 730*
a^6*b^2*c^2*d^3 + 245*a^7*b*c*d^4 - 37*a^8*d^5 + 60*(20*b^8*c^3*d^2 - 15*a*
b^7*c^2*d^3 + 6*a^2*b^6*c*d^4 - a^3*b^5*d^5)*x^5 - 30*(20*b^8*c^4*d - 235*a
*b^7*c^3*d^2 + 171*a^2*b^6*c^2*d^3 - 67*a^3*b^5*c*d^4 + 11*a^4*b^4*d^5)*x^4
 + 20*(20*b^8*c^5 - 175*a*b^7*c^4*d + 866*a^2*b^6*c^3*d^2 - 604*a^3*b^5*c^2
*d^3 + 230*a^4*b^4*c*d^4 - 37*a^5*b^3*d^5)*x^3 + 15*(35*a*b^7*c^5 - 271*a^2
*b^6*c^4*d + 1128*a^3*b^5*c^3*d^2 - 700*a^4*b^4*c^2*d^3 + 245*a^5*b^3*c*d^4
 - 37*a^6*b^2*d^5)*x^2 + 6*(47*a^2*b^6*c^5 - 345*a^3*b^5*c^4*d + 1320*a^4*b
```

```
^4*c^3*d^2 - 730*a^5*b^3*c^2*d^3 + 245*a^6*b^2*c*d^4 - 37*a^7*b*d^5)*x)/((b
^15*c^5 - 5*a*b^14*c^4*d + 10*a^2*b^13*c^3*d^2 - 10*a^3*b^12*c^2*d^3 + 5*a^
4*b^11*c*d^4 - a^5*b^10*d^5)*g^7*x^6 + 6*(a*b^14*c^5 - 5*a^2*b^13*c^4*d + 1
0*a^3*b^12*c^3*d^2 - 10*a^4*b^11*c^2*d^3 + 5*a^5*b^10*c*d^4 - a^6*b^9*d^5)*
g^7*x^5 + 15*(a^2*b^13*c^5 - 5*a^3*b^12*c^4*d + 10*a^4*b^11*c^3*d^2 - 10*a^
5*b^10*c^2*d^3 + 5*a^6*b^9*c*d^4 - a^7*b^8*d^5)*g^7*x^4 + 20*(a^3*b^12*c^5
- 5*a^4*b^11*c^4*d + 10*a^5*b^10*c^3*d^2 - 10*a^6*b^9*c^2*d^3 + 5*a^7*b^8*c
*d^4 - a^8*b^7*d^5)*g^7*x^3 + 15*(a^4*b^11*c^5 - 5*a^5*b^10*c^4*d + 10*a^6*
b^9*c^3*d^2 - 10*a^7*b^8*c^2*d^3 + 5*a^8*b^7*c*d^4 - a^9*b^6*d^5)*g^7*x^2 +
 6*(a^5*b^10*c^5 - 5*a^6*b^9*c^4*d + 10*a^7*b^8*c^3*d^2 - 10*a^8*b^7*c^2*d^
3 + 5*a^9*b^6*c*d^4 - a^10*b^5*d^5)*g^7*x + (a^6*b^9*c^5 - 5*a^7*b^8*c^4*d
+ 10*a^8*b^7*c^3*d^2 - 10*a^9*b^6*c^2*d^3 + 5*a^10*b^5*c*d^4 - a^11*b^4*d^5
)*g^7) + 60*(20*b^3*c^3*d^3 - 15*a*b^2*c^2*d^4 + 6*a^2*b*c*d^5 - a^3*d^6)*l
og(b*x + a)/((b^10*c^6 - 6*a*b^9*c^5*d + 15*a^2*b^8*c^4*d^2 - 20*a^3*b^7*c^
3*d^3 + 15*a^4*b^6*c^2*d^4 - 6*a^5*b^5*c*d^5 + a^6*b^4*d^6)*g^7) - 60*(20*b
^3*c^3*d^3 - 15*a*b^2*c^2*d^4 + 6*a^2*b*c*d^5 - a^3*d^6)*log(d*x + c)/((b^1
0*c^6 - 6*a*b^9*c^5*d + 15*a^2*b^8*c^4*d^2 - 20*a^3*b^7*c^3*d^3 + 15*a^4*b^
6*c^2*d^4 - 6*a^5*b^5*c*d^5 + a^6*b^4*d^6)*g^7)) - 1/1200*B*c*d^2*i^3*(60*(
15*b^2*x^2 + 6*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^9*g^7*x
^6 + 6*a*b^8*g^7*x^5 + 15*a^2*b^7*g^7*x^4 + 20*a^3*b^6*g^7*x^3 + 15*a^4*b^5
*g^7*x^2 + 6*a^5*b^4*g^7*x + a^6*b^3*g^7) + (37*a^2*b^5*c^5 - 245*a^3*b^4*c
^4*d + 730*a^4*b^3*c^3*d^2 - 1470*a^5*b^2*c^2*d^3 + 405*a^6*b*c*d^4 - 57*a^
7*d^5 - 60*(15*b^7*c^2*d^3 - 6*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 30*(15*b^7*
c^3*d^2 - 171*a*b^6*c^2*d^3 + 67*a^2*b^5*c*d^4 - 11*a^3*b^4*d^5)*x^4 - 20*(
15*b^7*c^4*d - 126*a*b^6*c^3*d^2 + 604*a^2*b^5*c^2*d^3 - 230*a^3*b^4*c*d^4
+ 37*a^4*b^3*d^5)*x^3 + 15*(15*b^7*c^5 - 111*a*b^6*c^4*d + 388*a^2*b^5*c^3*
d^2 - 1000*a^3*b^4*c^2*d^3 + 365*a^4*b^3*c*d^4 - 57*a^5*b^2*d^5)*x^2 + 6*(2
7*a*b^6*c^5 - 185*a^2*b^5*c^4*d + 580*a^3*b^4*c^3*d^2 - 1270*a^4*b^3*c^2*d^
3 + 405*a^5*b^2*c*d^4 - 57*a^6*b*d^5)*x)/((b^14*c^5 - 5*a*b^13*c^4*d + 10*a
^2*b^12*c^3*d^2 - 10*a^3*b^11*c^2*d^3 + 5*a^4*b^10*c*d^4 - a^5*b^9*d^5)*g^7
*x^6 + 6*(a*b^13*c^5 - 5*a^2*b^12*c^4*d + 10*a^3*b^11*c^3*d^2 - 10*a^4*b^10
*c^2*d^3 + 5*a^5*b^9*c*d^4 - a^6*b^8*d^5)*g^7*x^5 + 15*(a^2*b^12*c^5 - 5*a^
3*b^11*c^4*d + 10*a^4*b^10*c^3*d^2 - 10*a^5*b^9*c^2*d^3 + 5*a^6*b^8*c*d^4 -
 a^7*b^7*d^5)*g^7*x^4 + 20*(a^3*b^11*c^5 - 5*a^4*b^10*c^4*d + 10*a^5*b^9*c^
3*d^2 - 10*a^6*b^8*c^2*d^3 + 5*a^7*b^7*c*d^4 - a^8*b^6*d^5)*g^7*x^3 + 15*(a
^4*b^10*c^5 - 5*a^5*b^9*c^4*d + 10*a^6*b^8*c^3*d^2 - 10*a^7*b^7*c^2*d^3 + 5
*a^8*b^6*c*d^4 - a^9*b^5*d^5)*g^7*x^2 + 6*(a^5*b^9*c^5 - 5*a^6*b^8*c^4*d +
10*a^7*b^7*c^3*d^2 - 10*a^8*b^6*c^2*d^3 + 5*a^9*b^5*c*d^4 - a^10*b^4*d^5)*g
^7*x + (a^6*b^8*c^5 - 5*a^7*b^7*c^4*d + 10*a^8*b^6*c^3*d^2 - 10*a^9*b^5*c^2
*d^3 + 5*a^10*b^4*c*d^4 - a^11*b^3*d^5)*g^7) - 60*(15*b^2*c^2*d^4 - 6*a*b*c
*d^5 + a^2*d^6)*log(b*x + a)/((b^9*c^6 - 6*a*b^8*c^5*d + 15*a^2*b^7*c^4*d^2
 - 20*a^3*b^6*c^3*d^3 + 15*a^4*b^5*c^2*d^4 - 6*a^5*b^4*c*d^5 + a^6*b^3*d^6)
*g^7) + 60*(15*b^2*c^2*d^4 - 6*a*b*c*d^5 + a^2*d^6)*log(d*x + c)/((b^9*c^6
- 6*a*b^8*c^5*d + 15*a^2*b^7*c^4*d^2 - 20*a^3*b^6*c^3*d^3 + 15*a^4*b^5*c^2*
d^4 - 6*a^5*b^4*c*d^5 + a^6*b^3*d^6)*g^7)) - 1/600*B*c^2*d*i^3*(60*(6*b*x +
 a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^8*g^7*x^6 + 6*a*b^7*g^7*x^5 + 1
5*a^2*b^6*g^7*x^4 + 20*a^3*b^5*g^7*x^3 + 15*a^4*b^4*g^7*x^2 + 6*a^5*b^3*g^7
*x + a^6*b^2*g^7) + (22*a*b^5*c^5 - 140*a^2*b^4*c^4*d + 385*a^3*b^3*c^3*d^2
 - 615*a^4*b^2*c^2*d^3 + 735*a^5*b*c*d^4 - 87*a^6*d^5 + 60*(6*b^6*c*d^4 - a
*b^5*d^5)*x^5 - 30*(6*b^6*c^2*d^3 - 67*a*b^5*c*d^4 + 11*a^2*b^4*d^5)*x^4 +
20*(6*b^6*c^3*d^2 - 49*a*b^5*c^2*d^3 + 230*a^2*b^4*c*d^4 - 37*a^3*b^3*d^5)*
x^3 - 15*(6*b^6*c^4*d - 43*a*b^5*c^3*d^2 + 145*a^2*b^4*c^2*d^3 - 365*a^3*b^
3*c*d^4 + 57*a^4*b^2*d^5)*x^2 + 6*(12*b^6*c^5 - 80*a*b^5*c^4*d + 235*a^2*b^
4*c^3*d^2 - 415*a^3*b^3*c^2*d^3 + 585*a^4*b^2*c*d^4 - 87*a^5*b*d^5)*x)/((b^
13*c^5 - 5*a*b^12*c^4*d + 10*a^2*b^11*c^3*d^2 - 10*a^3*b^10*c^2*d^3 + 5*a^4
*b^9*c*d^4 - a^5*b^8*d^5)*g^7*x^6 + 6*(a*b^12*c^5 - 5*a^2*b^11*c^4*d + 10*a
^3*b^10*c^3*d^2 - 10*a^4*b^9*c^2*d^3 + 5*a^5*b^8*c*d^4 - a^6*b^7*d^5)*g^7*x
^5 + 15*(a^2*b^11*c^5 - 5*a^3*b^10*c^4*d + 10*a^4*b^9*c^3*d^2 - 10*a^5*b^8*
c^2*d^3 + 5*a^6*b^7*c*d^4 - a^7*b^6*d^5)*g^7*x^4 + 20*(a^3*b^10*c^5 - 5*a^4
```

```
*b^9*c^4*d + 10*a^5*b^8*c^3*d^2 - 10*a^6*b^7*c^2*d^3 + 5*a^7*b^6*c*d^4 - a^
8*b^5*d^5)*g^7*x^3 + 15*(a^4*b^9*c^5 - 5*a^5*b^8*c^4*d + 10*a^6*b^7*c^3*d^2
 - 10*a^7*b^6*c^2*d^3 + 5*a^8*b^5*c*d^4 - a^9*b^4*d^5)*g^7*x^2 + 6*(a^5*b^8
*c^5 - 5*a^6*b^7*c^4*d + 10*a^7*b^6*c^3*d^2 - 10*a^8*b^5*c^2*d^3 + 5*a^9*b^
4*c*d^4 - a^10*b^3*d^5)*g^7*x + (a^6*b^7*c^5 - 5*a^7*b^6*c^4*d + 10*a^8*b^5
*c^3*d^2 - 10*a^9*b^4*c^2*d^3 + 5*a^10*b^3*c*d^4 - a^11*b^2*d^5)*g^7) + 60*
(6*b*c*d^5 - a*d^6)*log(b*x + a)/((b^8*c^6 - 6*a*b^7*c^5*d + 15*a^2*b^6*c^4
*d^2 - 20*a^3*b^5*c^3*d^3 + 15*a^4*b^4*c^2*d^4 - 6*a^5*b^3*c*d^5 + a^6*b^2*
d^6)*g^7) - 60*(6*b*c*d^5 - a*d^6)*log(d*x + c)/((b^8*c^6 - 6*a*b^7*c^5*d +
 15*a^2*b^6*c^4*d^2 - 20*a^3*b^5*c^3*d^3 + 15*a^4*b^4*c^2*d^4 - 6*a^5*b^3*c
*d^5 + a^6*b^2*d^6)*g^7)) + 1/360*B*c^3*i^3*((60*b^5*d^5*x^5 - 10*b^5*c^5 +
 62*a*b^4*c^4*d - 163*a^2*b^3*c^3*d^2 + 237*a^3*b^2*c^2*d^3 - 213*a^4*b*c*d
^4 + 147*a^5*d^5 - 30*(b^5*c*d^4 - 11*a*b^4*d^5)*x^4 + 20*(b^5*c^2*d^3 - 8*
a*b^4*c*d^4 + 37*a^2*b^3*d^5)*x^3 - 15*(b^5*c^3*d^2 - 7*a*b^4*c^2*d^3 + 23*
a^2*b^3*c*d^4 - 57*a^3*b^2*d^5)*x^2 + 6*(2*b^5*c^4*d - 13*a*b^4*c^3*d^2 + 3
7*a^2*b^3*c^2*d^3 - 63*a^3*b^2*c*d^4 + 87*a^4*b*d^5)*x)/((b^12*c^5 - 5*a*b^
11*c^4*d + 10*a^2*b^10*c^3*d^2 - 10*a^3*b^9*c^2*d^3 + 5*a^4*b^8*c*d^4 - a^5
*b^7*d^5)*g^7*x^6 + 6*(a*b^11*c^5 - 5*a^2*b^10*c^4*d + 10*a^3*b^9*c^3*d^2 -
 10*a^4*b^8*c^2*d^3 + 5*a^5*b^7*c*d^4 - a^6*b^6*d^5)*g^7*x^5 + 15*(a^2*b^10
*c^5 - 5*a^3*b^9*c^4*d + 10*a^4*b^8*c^3*d^2 - 10*a^5*b^7*c^2*d^3 + 5*a^6*b^
6*c*d^4 - a^7*b^5*d^5)*g^7*x^4 + 20*(a^3*b^9*c^5 - 5*a^4*b^8*c^4*d + 10*a^5
*b^7*c^3*d^2 - 10*a^6*b^6*c^2*d^3 + 5*a^7*b^5*c*d^4 - a^8*b^4*d^5)*g^7*x^3
+ 15*(a^4*b^8*c^5 - 5*a^5*b^7*c^4*d + 10*a^6*b^6*c^3*d^2 - 10*a^7*b^5*c^2*d
^3 + 5*a^8*b^4*c*d^4 - a^9*b^3*d^5)*g^7*x^2 + 6*(a^5*b^7*c^5 - 5*a^6*b^6*c^
4*d + 10*a^7*b^5*c^3*d^2 - 10*a^8*b^4*c^2*d^3 + 5*a^9*b^3*c*d^4 - a^10*b^2*
d^5)*g^7*x + (a^6*b^6*c^5 - 5*a^7*b^5*c^4*d + 10*a^8*b^4*c^3*d^2 - 10*a^9*b
^3*c^2*d^3 + 5*a^10*b^2*c*d^4 - a^11*b*d^5)*g^7) - 60*log(b*e*x/(d*x + c) +
 a*e/(d*x + c))/(b^7*g^7*x^6 + 6*a*b^6*g^7*x^5 + 15*a^2*b^5*g^7*x^4 + 20*a^
3*b^4*g^7*x^3 + 15*a^4*b^3*g^7*x^2 + 6*a^5*b^2*g^7*x + a^6*b*g^7) + 60*d^6*
log(b*x + a)/((b^7*c^6 - 6*a*b^6*c^5*d + 15*a^2*b^5*c^4*d^2 - 20*a^3*b^4*c^
3*d^3 + 15*a^4*b^3*c^2*d^4 - 6*a^5*b^2*c*d^5 + a^6*b*d^6)*g^7) - 60*d^6*log
(d*x + c)/((b^7*c^6 - 6*a*b^6*c^5*d + 15*a^2*b^5*c^4*d^2 - 20*a^3*b^4*c^3*d
^3 + 15*a^4*b^3*c^2*d^4 - 6*a^5*b^2*c*d^5 + a^6*b*d^6)*g^7)) - 1/10*(6*b*x
+ a)*A*c^2*d*i^3/(b^8*g^7*x^6 + 6*a*b^7*g^7*x^5 + 15*a^2*b^6*g^7*x^4 + 20*a
^3*b^5*g^7*x^3 + 15*a^4*b^4*g^7*x^2 + 6*a^5*b^3*g^7*x + a^6*b^2*g^7) - 1/20
*(15*b^2*x^2 + 6*a*b*x + a^2)*A*c*d^2*i^3/(b^9*g^7*x^6 + 6*a*b^8*g^7*x^5 +
15*a^2*b^7*g^7*x^4 + 20*a^3*b^6*g^7*x^3 + 15*a^4*b^5*g^7*x^2 + 6*a^5*b^4*g^
7*x + a^6*b^3*g^7) - 1/60*(20*b^3*x^3 + 15*a*b^2*x^2 + 6*a^2*b*x + a^3)*A*d
^3*i^3/(b^10*g^7*x^6 + 6*a*b^9*g^7*x^5 + 15*a^2*b^8*g^7*x^4 + 20*a^3*b^7*g^
7*x^3 + 15*a^4*b^6*g^7*x^2 + 6*a^5*b^5*g^7*x + a^6*b^4*g^7) - 1/6*A*c^3*i^3
/(b^7*g^7*x^6 + 6*a*b^6*g^7*x^5 + 15*a^2*b^5*g^7*x^4 + 20*a^3*b^4*g^7*x^3 +
 15*a^4*b^3*g^7*x^2 + 6*a^5*b^2*g^7*x + a^6*b*g^7)
```

Fricas [B] time = 0.59535, size = 2057, normalized size = 7.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x, algor
ithm="fricas")
```

```
[Out] -1/3600*(60*(B*b^6*c*d^5 - B*a*b^5*d^6)*i^3*x^5 - 30*(B*b^6*c^2*d^4 - 12*B*
a*b^5*c*d^5 + 11*B*a^2*b^4*d^6)*i^3*x^4 + 20*((60*A + B)*b^6*c^3*d^3 - 9*(2
0*A + B)*a*b^5*c^2*d^4 + 45*(4*A + B)*a^2*b^4*c*d^5 - (60*A + 37*B)*a^3*b^3
*d^6)*i^3*x^3 + 15*((180*A + 19*B)*b^6*c^4*d^2 - 24*(20*A + 3*B)*a*b^5*c^3*
d^3 + 90*(4*A + B)*a^2*b^4*c^2*d^4 - (60*A + 37*B)*a^4*b^2*d^6)*i^3*x^2 + 6
```

```
*(4*(90*A + 13*B)*b^6*c^5*d - 15*(60*A + 11*B)*a*b^5*c^4*d^2 + 150*(4*A + B
)*a^2*b^4*c^3*d^3 - (60*A + 37*B)*a^5*b*d^6)*i^3*x + (100*(6*A + B)*b^6*c^6
 - 288*(5*A + B)*a*b^5*c^5*d + 225*(4*A + B)*a^2*b^4*c^4*d^2 - (60*A + 37*B
)*a^6*d^6)*i^3 + 60*(B*b^6*d^6*i^3*x^6 + 6*B*a*b^5*d^6*i^3*x^5 + 15*B*a^2*b
^4*d^6*i^3*x^4 + 20*(B*b^6*c^3*d^3 - 3*B*a*b^5*c^2*d^4 + 3*B*a^2*b^4*c*d^5)
*i^3*x^3 + 15*(3*B*b^6*c^4*d^2 - 8*B*a*b^5*c^3*d^3 + 6*B*a^2*b^4*c^2*d^4)*i
^3*x^2 + 6*(6*B*b^6*c^5*d - 15*B*a*b^5*c^4*d^2 + 10*B*a^2*b^4*c^3*d^3)*i^3*
x + (10*B*b^6*c^6 - 24*B*a*b^5*c^5*d + 15*B*a^2*b^4*c^4*d^2)*i^3)*log((b*e*
x + a*e)/(d*x + c)))/((b^13*c^3 - 3*a*b^12*c^2*d + 3*a^2*b^11*c*d^2 - a^3*b
^10*d^3)*g^7*x^6 + 6*(a*b^12*c^3 - 3*a^2*b^11*c^2*d + 3*a^3*b^10*c*d^2 - a^
4*b^9*d^3)*g^7*x^5 + 15*(a^2*b^11*c^3 - 3*a^3*b^10*c^2*d + 3*a^4*b^9*c*d^2
- a^5*b^8*d^3)*g^7*x^4 + 20*(a^3*b^10*c^3 - 3*a^4*b^9*c^2*d + 3*a^5*b^8*c*d
^2 - a^6*b^7*d^3)*g^7*x^3 + 15*(a^4*b^9*c^3 - 3*a^5*b^8*c^2*d + 3*a^6*b^7*c
*d^2 - a^7*b^6*d^3)*g^7*x^2 + 6*(a^5*b^8*c^3 - 3*a^6*b^7*c^2*d + 3*a^7*b^6*
c*d^2 - a^8*b^5*d^3)*g^7*x + (a^6*b^7*c^3 - 3*a^7*b^6*c^2*d + 3*a^8*b^5*c*d
^2 - a^9*b^4*d^3)*g^7)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**7,x)

[Out] Timed out
```

Giac [B] time = 1.41452, size = 1678, normalized size = 5.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x, algor
ithm="giac")

[Out] -1/60*B*d^6*log(b*x + a)/(b^7*c^3*g^7*i - 3*a*b^6*c^2*d*g^7*i + 3*a^2*b^5*c
*d^2*g^7*i - a^3*b^4*d^3*g^7*i) + 1/60*B*d^6*log(d*x + c)/(b^7*c^3*g^7*i -
3*a*b^6*c^2*d*g^7*i + 3*a^2*b^5*c*d^2*g^7*i - a^3*b^4*d^3*g^7*i) + 1/60*(20
*B*b^3*d^3*i*x^3 + 45*B*b^3*c*d^2*i*x^2 + 15*B*a*b^2*d^3*i*x^2 + 36*B*b^3*c
^2*d*i*x + 18*B*a*b^2*c*d^2*i*x + 6*B*a^2*b*d^3*i*x + 10*B*b^3*c^3*i + 6*B*
a*b^2*c^2*d*i + 3*B*a^2*b*c*d^2*i + B*a^3*d^3*i)*log((b*x + a)/(d*x + c))/(
b^10*g^7*x^6 + 6*a*b^9*g^7*x^5 + 15*a^2*b^8*g^7*x^4 + 20*a^3*b^7*g^7*x^3 +
15*a^4*b^6*g^7*x^2 + 6*a^5*b^5*g^7*x + a^6*b^4*g^7) - 1/3600*(60*B*b^5*d^5*
x^5 - 30*B*b^5*c*d^4*x^4 + 330*B*a*b^4*d^5*x^4 + 1200*A*b^5*c^2*d^3*x^3 + 1
220*B*b^5*c^2*d^3*x^3 - 2400*A*a*b^4*c*d^4*x^3 - 2560*B*a*b^4*c*d^4*x^3 + 1
200*A*a^2*b^3*d^5*x^3 + 1940*B*a^2*b^3*d^5*x^3 + 2700*A*b^5*c^3*d^2*x^2 + 2
985*B*b^5*c^3*d^2*x^2 - 4500*A*a*b^4*c^2*d^3*x^2 - 5295*B*a*b^4*c^2*d^3*x^2
 + 900*A*a^2*b^3*c*d^4*x^2 + 1455*B*a^2*b^3*c*d^4*x^2 + 900*A*a^3*b^2*d^5*x
^2 + 1455*B*a^3*b^2*d^5*x^2 + 2160*A*b^5*c^4*d*x + 2472*B*b^5*c^4*d*x - 324
0*A*a*b^4*c^3*d^2*x - 3918*B*a*b^4*c^3*d^2*x + 360*A*a^2*b^3*c^2*d^3*x + 58
2*B*a^2*b^3*c^2*d^3*x + 360*A*a^3*b^2*c*d^4*x + 582*B*a^3*b^2*c*d^4*x + 360
*A*a^4*b*d^5*x + 582*B*a^4*b*d^5*x + 600*A*b^5*c^5 + 700*B*b^5*c^5 - 840*A*
a*b^4*c^4*d - 1028*B*a*b^4*c^4*d + 60*A*a^2*b^3*c^3*d^2 + 97*B*a^2*b^3*c^3*
```

```
d^2 + 60*A*a^3*b^2*c^2*d^3 + 97*B*a^3*b^2*c^2*d^3 + 60*A*a^4*b*c*d^4 + 97*B
*a^4*b*c*d^4 + 60*A*a^5*d^5 + 97*B*a^5*d^5)/(b^12*c^2*g^7*i*x^6 - 2*a*b^11*
c*d*g^7*i*x^6 + a^2*b^10*d^2*g^7*i*x^6 + 6*a*b^11*c^2*g^7*i*x^5 - 12*a^2*b^
10*c*d*g^7*i*x^5 + 6*a^3*b^9*d^2*g^7*i*x^5 + 15*a^2*b^10*c^2*g^7*i*x^4 - 30
*a^3*b^9*c*d*g^7*i*x^4 + 15*a^4*b^8*d^2*g^7*i*x^4 + 20*a^3*b^9*c^2*g^7*i*x^
3 - 40*a^4*b^8*c*d*g^7*i*x^3 + 20*a^5*b^7*d^2*g^7*i*x^3 + 15*a^4*b^8*c^2*g^
7*i*x^2 - 30*a^5*b^7*c*d*g^7*i*x^2 + 15*a^6*b^6*d^2*g^7*i*x^2 + 6*a^5*b^7*c
^2*g^7*i*x - 12*a^6*b^6*c*d*g^7*i*x + 6*a^7*b^5*d^2*g^7*i*x + a^6*b^6*c^2*g
^7*i - 2*a^7*b^5*c*d*g^7*i + a^8*b^4*d^2*g^7*i)
```

3.31 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=252

$$\frac{Bg^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{6d^2i}+\frac{g^3(a+bx)(bc-ad)^2\left(6B\log\left(\frac{e(\cdots}{c\cdots}\right.\right.}{6d^3i}$$

```
[Out] (g^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d*i) - ((b*c - a*
d)*g^3*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(6*d^2*i)
+ ((b*c - a*d)^2*g^3*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)
]))/(6*d^3*i) + ((b*c - a*d)^3*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11
*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(6*d^4*i) + (B*(b*c - a*d)^3*g^3*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i)
```

Rubi [A] time = 0.625548, antiderivative size = 408, normalized size of antiderivative = 1.62, number of steps used = 23, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bg^3(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^4i}-\frac{g^3(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^2i}-\frac{g^3(bc-ad)^3\log(ci+dix)\left(B\log\left(\frac{e(a+b\cdots}{c+dx}\right.\right.}{d^4i}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x),x]
```

```
[Out] (A*b*(b*c - a*d)^2*g^3*x)/(d^3*i) + (5*b*B*(b*c - a*d)^2*g^3*x)/(6*d^3*i) -
 (B*(b*c - a*d)*g^3*(a + b*x)^2)/(6*d^2*i) + (B*(b*c - a*d)^2*g^3*(a + b*x)
*Log[(e*(a + b*x))/(c + d*x)])/(d^3*i) - ((b*c - a*d)*g^3*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i) + (g^3*(a + b*x)^3*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(3*d*i) - (11*B*(b*c - a*d)^3*g^3*Log[c + d*x])/(6
*d^4*i) - (B*(b*c - a*d)^3*g^3*Log[i*(c + d*x)]^2)/(2*d^4*i) + (B*(b*c - a*
d)^3*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i + d*i*x])/(d^4*i) - ((b*
c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c*i + d*i*x])/(d^4*
i) + (B*(b*c - a*d)^3*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{31c+31dx}\,dx=\int\left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{31d^3}+\frac{(-bc+ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^3(31c+31dx)}\right.$$

$$=\frac{(bg)\int(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{31d}-\frac{\left(b(bc-ad)g^2\right)\int(ag+bgx)\left(A+\right.}{31d^2}$$

$$=\frac{Ab(bc-ad)^2g^3x}{31d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{62d^2}+\frac{g^3(a+bx)^3\left(A\right.}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{31d^3}+\frac{B(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{31d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(\right.}{62}$$

$$=\frac{Ab(bc-ad)^2g^3x}{31d^3}+\frac{B(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{31d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(\right.}{62}$$

$$=\frac{Ab(bc-ad)^2g^3x}{31d^3}+\frac{5bB(bc-ad)^2g^3x}{186d^3}-\frac{B(bc-ad)g^3(a+bx)^2}{186d^2}+\frac{B(bc-ad)^2g^3}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{31d^3}+\frac{5bB(bc-ad)^2g^3x}{186d^3}-\frac{B(bc-ad)g^3(a+bx)^2}{186d^2}+\frac{B(bc-ad)^2g^3}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{31d^3}+\frac{5bB(bc-ad)^2g^3x}{186d^3}-\frac{B(bc-ad)g^3(a+bx)^2}{186d^2}+\frac{B(bc-ad)^2g^3}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{31d^3}+\frac{5bB(bc-ad)^2g^3x}{186d^3}-\frac{B(bc-ad)g^3(a+bx)^2}{186d^2}+\frac{B(bc-ad)^2g^3}{}$$

Mathematica [A] time = 0.284686, size = 354, normalized size = 1.4

$$\frac{g^3\left(3B(bc-ad)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(i(c+dx))\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(i(c+dx))\right)\right)+2d^3(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x),x]
```

```
[Out] (g^3*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b
*x))/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B
*(b*c - a*d)^3*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a +
 b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c
) + a*d)*Log[c + d*x]) - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
])*Log[i*(c + d*x)] + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[i*(c + d*x)])*Log[i*(c + d*x)] + 2*PolyLog[2, (b*(c + d*x))/(b*c -
```

```
a*d)]))))/(6*d^4*i)
```

Maple [B] time = 0.187, size = 4297, normalized size = 17.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] -11/6/d*B*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3-1/d*B*g^3/i*dil
og(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^3-1/d*A*g^3/i*ln(d*(b*e/d+
(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3+1/d^4*B*g^3/i*dilog(-(d*(b*e/d+(a*d-b*c)*e/
d/(d*x+c))-b*e)/b/e)*b^3*c^3-1/d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln
(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^3+11/6/d^4*B*g^3/i*ln(d*(b*e
/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^3*c^3+1/d^4*A*g^3/i*ln(d*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))-b*e)*b^3*c^3+3/2*e^2/d*B*g^3/i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3-3*e/d^4*B*g^3/i*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^4*c^3+1/3*e^3*d^2*B*g^3/i*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^6/(d*x+c)^3-
3*e/d^4*A*g^3/i*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3+7/6*e/d*B*g^3/i*b/(d*
e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+11/2/d^2*B*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(
d*x+c))-b*e)*a^2*b*c+3*e*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)*a^4/(d*x+c)+3/d^2*B*g^3/i*dilog(-(d*(b*e/d+(a*d-b*c)*e/
d/(d*x+c))-b*e)/b/e)*a^2*b*c+1/3*e^3/d*A*g^3/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^3*a^3-3/d^3*B*g^3/i*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)
*b^2*c^2*a+1/d^4*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d
-b*c)*e/d/(d*x+c))-b*e)/b/e)*b^3*c^3-11/2/d^3*B*g^3/i*ln(d*(b*e/d+(a*d-b*c)
*e/d/(d*x+c))-b*e)*b^2*c^2*a+5*e^3/d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^4*c^4/(d*x+c)^3*a^2+18*e/d^2*B*g^3/i*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^2*c^2/(d*x+
c)*a^2-20/3*e^3/d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^3*b^3*c^3/(d*x+c)^3*a^3-12*e/d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)*b*c-12*e/d^3*B*g^3/i*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^3/(d*x+c)*
a+15*e^2/d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)^2*b^3*c^3/(d*x+c)^2*a^2-2*e^3*d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5/(d*x+c)^3*b*c-15*e^2/d*B*g^3/i*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*
b^2*c^2-2*e^3/d^3*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^3*b^5*c^5/(d*x+c)^3*a-15/2*e^2/d^3*B*g^3/i*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^4/(d*x+c)^2*a-3/2*e^2/d^
4*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b
^5*c^3-9/2*e^2/d^2*A*g^3/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+9/2*e^
2/d^3*A*g^3/i*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2*a-9/2*e^2/d^2*B*g^3/i
*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+
9*e/d^3*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)*a*b^3*c^2+3*e/d^4*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)*b^4*c^4/(d*x+c)+1/3*e^3/d^4*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^6*c^6/(d*x+c)^3+9/2*e^2/d^3*B*g^
3/i*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c
^2+3/2*e^2/d^4*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^2*b^5*c^5/(d*x+c)^2-e^3/d^2*B*g^3/i*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c+e^3/d^3*B*g^3/i*b^5*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a*c^2+15/2*e^2*B*g^3/
i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+
c)^2*b*c+5*e^3*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
```

```
x+c)*b*c)^3*a^4/(d*x+c)^3*b^2*c^2-9*e/d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*b^2*c-3/2*e^2*d*B*g^3/i*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^5/(d*x+c)^2-1/3*e^3
/d^4*B*g^3/i*b^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)^3*c^3+3*e/d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d
*x+c)*b*c)*a^3*b+3/d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2*b*c+1/2*e^2/d^3*B*g^3/i*b^4/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)^2*c^2*a-7/2*e/d^2*B*g^3/i*b^2/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)*a^2*c-1/2*e^2/d^2*B*g^3/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+
7/2*e/d^3*B*g^3/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*a-3/d^3*B*g^3/i*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)
*a*b^2*c^2+1/3*e^3/d*B*g^3/i*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^3*a^3+e^3/d^3*A*g^3/i*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
^3*c^2*a-9*e/d^2*A*g^3/i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c+9*e/d^3*A*
g^3/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c^2-e^3/d^2*A*g^3/i*b^4/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^3*a^2*c-7/6*e/d^4*B*g^3/i*b^4/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)*c^3-3/d^3*A*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^2*c^2*a+3
/d^2*A*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*b*c-3/2*e^2/d^4*A*
g^3/i*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3-1/3*e^3/d^4*A*g^3/i*b^6/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3+3/2*e^2/d*A*g^3/i*b^2/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)^2*a^3-1/6*e^2/d^4*B*g^3/i*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3+3
*e/d*A*g^3/i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+1/6*e^2/d*B*g^3/i*b^2/(d*e
/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3
```

Maxima [B] time = 1.5426, size = 1067, normalized size = 4.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] 3*A*a^2*b*g^3*(x/(d*i) - c*log(d*x + c)/(d^2*i)) - 1/6*A*b^3*g^3*(6*c^3*log
(d*x + c)/(d^4*i) - (2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/(d^3*i)) + 3/2*A*a*b^
2*g^3*(2*c^2*log(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A*a^3*g^3*lo
g(d*i*x + c*i)/(d*i) - (b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3
 - a^3*d^3*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(
b*d*x + a*d)/(b*c - a*d)))*B/(d^4*i) + 1/6*(6*a^3*d^3*g^3*log(e) - (6*g^3*l
og(e) + 11*g^3)*b^3*c^3 + 9*(2*g^3*log(e) + 3*g^3)*a*b^2*c^2*d - 18*(g^3*lo
g(e) + g^3)*a^2*b*c*d^2)*B*log(d*x + c)/(d^4*i) + 1/6*(2*B*b^3*d^3*g^3*x^3*
log(e) - ((3*g^3*log(e) + g^3)*b^3*c*d^2 - (9*g^3*log(e) + g^3)*a*b^2*d^3)*
B*x^2 + 3*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^
3)*B*log(d*x + c)^2 + ((6*g^3*log(e) + 5*g^3)*b^3*c^2*d - 6*(3*g^3*log(e) +
 2*g^3)*a*b^2*c*d^2 + (18*g^3*log(e) + 7*g^3)*a^2*b*d^3)*B*x + (2*B*b^3*d^3
*g^3*x^3 - 3*(b^3*c*d^2*g^3 - 3*a*b^2*d^3*g^3)*B*x^2 + 6*(b^3*c^2*d*g^3 - 3
*a*b^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B*x + (6*a*b^2*c^2*d*g^3 - 15*a^2*b*c*d
^2*g^3 + 11*a^3*d^3*g^3)*B)*log(b*x + a) - (2*B*b^3*d^3*g^3*x^3 - 3*(b^3*c*
d^2*g^3 - 3*a*b^2*d^3*g^3)*B*x^2 + 6*(b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3 + 3
*a^2*b*d^3*g^3)*B*x)*log(d*x + c))/(d^4*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^3g^3x^3 + 3\,Aab^2g^3x^2 + 3\,Aa^2bg^3x + Aa^3g^3 + \left(Bb^3g^3x^3 + 3\,Bab^2g^3x^2 + 3\,Ba^2bg^3x + Ba^3g^3\right)\log\left(\frac{bex+ae}{dx+c}\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] integral((A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3 +
 (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((b*e
*x + a*e)/(d*x + c)))/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i),
 x)
```

3.32 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=198

$$-\frac{Bg^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}-\frac{g^2(a+bx)(bc-ad)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+B\right)}{2d^2i}-\frac{g^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\ldots\right.}{2d^3i}$$

```
[Out] (g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d*i) - ((b*c - a*
d)*g^2*(a + b*x)*(2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i) -
((b*c - a*d)^2*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(
a + b*x))/(c + d*x)]))/(2*d^3*i) - (B*(b*c - a*d)^2*g^2*PolyLog[2, (d*(a +
b*x))/(b*(c + d*x))])/(d^3*i)
```

Rubi [A] time = 0.487327, antiderivative size = 329, normalized size of antiderivative = 1.66, number of steps used = 19, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{Bg^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^3i}+\frac{g^2(bc-ad)^2\log(ci+dix)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i}+\frac{g^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\ldots\right.}{2di}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x),x]
```

```
[Out] -((A*b*(b*c - a*d)*g^2*x)/(d^2*i)) - (b*B*(b*c - a*d)*g^2*x)/(2*d^2*i) - (B
*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d^2*i) + (g^2*(a
+ b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d*i) + (3*B*(b*c - a*d)^2
*g^2*Log[c + d*x])/(2*d^3*i) + (B*(b*c - a*d)^2*g^2*Log[i*(c + d*x)]^2)/(2*
d^3*i) - (B*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i + d
*i*x])/(d^3*i) + ((b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Lo
g[c*i + d*i*x])/(d^3*i) - (B*(b*c - a*d)^2*g^2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/(d^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{32c+32dx}\,dx = \int\left(-\frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{32d^2}+\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^2(32c+32dx)}+\cdots\right.$$

$$=\frac{(bg)\int(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{32d}-\frac{\left(b(bc-ad)g^2\right)\int\left(A+B\log\left(\frac{e(a+b\cdots}{c+d\cdots}\right.\right.}{32d^2}$$

$$=-\frac{Ab(bc-ad)g^2x}{32d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{64d}+\frac{(bc-ad)^2g^2\left(A+B\log\cdots\right.}{\cdots}$$

$$=-\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(a+bx)^2\left(A+B\log\cdots\right.}{64d}$$

$$=-\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(a+bx)^2\left(A+B\log\cdots\right.}{64d}$$

$$=-\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(\cdots}{\cdots}$$

$$=-\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(\cdots}{\cdots}$$

$$=-\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(\cdots}{\cdots}$$

$$=-\frac{Ab(bc-ad)g^2x}{32d^2}-\frac{bB(bc-ad)g^2x}{64d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{32d^2}+\frac{g^2(\cdots}{\cdots}$$

Mathematica [A] time = 0.170747, size = 254, normalized size = 1.28

$$\frac{g^2\left(-B(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(i(c+dx))\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(i(c+dx))\right)\right)+d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x),x]
```

```
[Out] (g^2*(-2*A*b*d*(b*c - a*d)*x + 2*B*d*(-(b*c) + a*d)*(a + b*x)*Log[(e*(a + b
*x))/(c + d*x)] + d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*
B*(b*c - a*d)^2*Log[c + d*x] - B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c
+ d*x]) + 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[i*(c + d
*x)] - B*(b*c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[i*(c + d
*x)])*Log[i*(c + d*x)] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^3*
i)
```

Maple [B] time = 0.189, size = 2309, normalized size = 11.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] -1/d*B*g^2/i*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2-1/d*A*g^
2/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-3/2/d*B*g^2/i*ln(d*(b*e/d+(
a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-3*e^2/d*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*b^2*c^2+6*e/d^2*B*g^2/i*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a/(d*x+c)*b^2*
c^2+2*e^2/d^2*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^2*a/(d*x+c)^2*b^3*c^3-6*e/d*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2/(d*x+c)*b*c-3/2/d^3*B*g^2/i*ln(d*(b*e/d
+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^2*c^2-e^2/d^2*A*g^2/i*b^3/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)^2*c*a-e/d^2*B*g^2/i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c-4*e/d
^2*A*g^2/i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c+1/2*e^2/d^3*B*g^2/i*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^2+2*e/d*B*g
^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*b+2*
e/d^3*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
*b^3*c^2+2/d^2*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-b*e)/b/e)*a*b*c+1/2*e^2/d*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*b^2-1/2*e^2*d*B*g^2/i*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2+2*e^2*
B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3
/(d*x+c)^2*b*c-1/d^3*A*g^2/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^2*c^
2-1/d*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(
d*x+c))-b*e)/b/e)*a^2-1/d^3*B*g^2/i*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
-b*e)/b/e)*b^2*c^2+2/d^2*B*g^2/i*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*
e)/b/e)*a*b*c+2/d^2*A*g^2/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*b*c-1
/d^3*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d
*x+c))-b*e)/b/e)*b^2*c^2+2*e/d*A*g^2/i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2+
1/2*e/d^3*B*g^2/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+1/2*e^2/d*A*g^2/i*b
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2+1/2*e^2/d^3*A*g^2/i*b^4/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)^2*c^2+1/2*e/d*B*g^2/i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2
+2*e/d^3*A*g^2/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+2*e*B*g^2/i*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)+3/d^2*B*g
^2/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*b*c-4*e/d^2*B*g^2/i*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*b^2*c-2*e/d^3*B*g^2
/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^3/(d
*x+c)-e^2/d^2*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^2*b^3*c*a-1/2*e^2/d^3*B*g^2/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e
/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^4/(d*x+c)^2
```

Maxima [B] time = 1.45319, size = 644, normalized size = 3.25

$$2\,Aabg^2\left(\frac{x}{di}-\frac{c\log\left(dx+c\right)}{d^2i}\right)+\frac{1}{2}\,Ab^2g^2\left(\frac{2\,c^2\log\left(dx+c\right)}{d^3i}+\frac{dx^2-2\,cx}{d^2i}\right)+\frac{Aa^2g^2\log\left(dix+ci\right)}{di}+\frac{\left(b^2c^2g^2-2\,abcdg^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] 2*A*a*b*g^2*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + 1/2*A*b^2*g^2*(2*c^2*log(d
*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A*a^2*g^2*log(d*i*x + c*i)/(d*
i) + (b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*(log(b*x + a)*log((b*d*x +
 a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^3*i) + 1/2
*(2*a^2*d^2*g^2*log(e) + (2*g^2*log(e) + 3*g^2)*b^2*c^2 - 4*(g^2*log(e) + g
^2)*a*b*c*d)*B*log(d*x + c)/(d^3*i) + 1/2*(B*b^2*d^2*g^2*x^2*log(e) - (b^2*
c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B*log(d*x + c)^2 - ((2*g^2*log(e) +
g^2)*b^2*c*d - (4*g^2*log(e) + g^2)*a*b*d^2)*B*x + (B*b^2*d^2*g^2*x^2 - 2*(
b^2*c*d*g^2 - 2*a*b*d^2*g^2)*B*x - (2*a*b*c*d*g^2 - 3*a^2*d^2*g^2)*B)*log(b
*x + a) - (B*b^2*d^2*g^2*x^2 - 2*(b^2*c*d*g^2 - 2*a*b*d^2*g^2)*B*x)*log(d*x
 + c))/(d^3*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^2g^2x^2 + 2\,Aabg^2x + Aa^2g^2 + \left(Bb^2g^2x^2 + 2\,Babg^2x + Ba^2g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*
a*b*g^2*x + B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{dix + ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i),
 x)
```

3.33 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=125

$$\frac{Bg(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}+\frac{g(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{d^2i}+\frac{g(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right.}{di}$$

```
[Out] (g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d*i) + ((b*c - a*d)*g*L
og[(b*c - a*d)/(b*(c + d*x))]*(A + B + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^
2*i) + (B*(b*c - a*d)*g*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i)
```

Rubi [A] time = 0.354912, antiderivative size = 213, normalized size of antiderivative = 1.7, number of steps used = 14, number of rules used = 11, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.29, Rules used = {2528, 2486, 31, 2524, 12, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bg(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2i}-\frac{g(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i}-\frac{Bg(bc-ad)\log^2(c+dx)}{2d^2i}+\frac{Bg(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x),x]
```

```
[Out] (A*b*g*x)/(d*i) + (B*g*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d*i) - (B*(
b*c - a*d)*g*Log[c + d*x])/(d^2*i) + (B*(b*c - a*d)*g*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x])/(d^2*i) - ((b*c - a*d)*g*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])*Log[c + d*x])/(d^2*i) - (B*(b*c - a*d)*g*Log[c + d*x]^2)/(2*d
^2*i) + (B*(b*c - a*d)*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{33c+33dx}\,dx = \int \left(\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{33d} + \frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{33d(c+dx)}\right) dx$$

$$= \frac{(bg)\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx}{33d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{33d}$$

$$= \frac{Abgx}{33d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{33d^2} + \frac{(bBg)\int \log\left(\frac{e(a+bx)}{c+dx}\right)}{33d}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+d}{33d^2}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} - \frac{(bc-ad)g\left(A\right.}{}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} - \frac{(bc-ad)g\left(A\right.}{}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} + \frac{B(bc-ad)g\,\mathrm{lo}}{}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} + \frac{B(bc-ad)g\,\mathrm{lo}}{}$$

$$= \frac{Abgx}{33d} + \frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{33d} - \frac{B(bc-ad)g\log(c+dx)}{33d^2} + \frac{B(bc-ad)g\,\mathrm{lo}}{}$$

Mathematica [A] time = 0.107321, size = 162, normalized size = 1.3

$$\frac{g\left(B(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a}{c+}\right.\right.\right.}{2d^2i}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x
),x]
```

```
[Out] (g*(2*A*b*d*x + 2*B*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 2*B*(b*c - a
*d)*Log[c + d*x] - 2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
 + d*x] + B*(b*c - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x
])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^2*i)
```

Maple [B] time = 0.158, size = 895, normalized size = 7.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] -1/d*g/i*A*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d^2*g/i*A*ln(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b*c+e/d*g/i*A*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
```

```
*a-e/d^2*g/i*A*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c-1/d*g/i*B*dilog(-(d*(b*e
/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*g/i*B*dilog(-(d*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-b*e)/b/e)*b*c-1/d*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-
(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*g/i*B*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-1/d*g/i*B*
ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d^2*g/i*B*ln(d*(b*e/d+(a*d-b*c)
*e/d/(d*x+c))-b*e)*b*c+e/d*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)*b*a-e/d^2*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d
*x+c)*a-e/(d*x+c)*b*c)*b^2*c+e*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a^2-2*e/d*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*b*c+e/d^2*g/i*B*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*b^2*c^2
```

Maxima [A] time = 1.49421, size = 298, normalized size = 2.38

$$Abg\left(\frac{x}{di}-\frac{c\log\left(dx+c\right)}{d^2i}\right)+\frac{Aag\log\left(dix+ci\right)}{di}-\frac{\left(bcg-adg\right)\left(\log\left(bx+a\right)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{d^2i}+\frac{\left(adg\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm
="maxima")
```

```
[Out] A*b*g*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + A*a*g*log(d*i*x + c*i)/(d*i) - (
b*c*g - a*d*g)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b
*d*x + a*d)/(b*c - a*d)))*B/(d^2*i) + (a*d*g*log(e) - (g*log(e) + g)*b*c)*B
*log(d*x + c)/(d^2*i) - 1/2*(2*B*b*d*g*x*log(d*x + c) - 2*B*b*d*g*x*log(e)
- (b*c*g - a*d*g)*B*log(d*x + c)^2 - 2*(B*b*d*g*x + B*a*d*g)*log(b*x + a))/
(d^2*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{bex+ae}{dx+c}\right)}{dix+ci},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm
="fricas")
```

```
[Out] integral((A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((b*e*x + a*e)/(d*x + c)))
/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm
="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i), x
)
```

3.34 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ci+dix}\,dx$

Optimal. Leaf size=76

$$-\frac{B\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{di}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di}$$

```
[Out] -((Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d*
i)) - (B*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d*i)
```

Rubi [A] time = 0.215483, antiderivative size = 122, normalized size of antiderivative = 1.61, number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2524, 12, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di}+\frac{\log(ci+dix)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di}-\frac{B\log(ci+dix)\log\left(-\frac{d(a+bx)}{bc-ad}\right)}{di}+\frac{B\log^2(i(c+dx))}{2di}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x),x]
```

```
[Out] (B*Log[i*(c + d*x)]^2)/(2*d*i) - (B*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
*i + d*i*x])/(d*i) + ((A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c*i + d*i*x]
)/(d*i) - (B*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*i)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
```

```
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{34c+34dx}\,dx &= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(34c+34dx)}{e(a+bx)}\,dx}{34d} \\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(34c+34dx)}{a+bx}\,dx}{34de} \\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} - \frac{B\int \left(\frac{be\log(34c+34dx)}{a+bx}-\frac{de\log(34c+34dx)}{c+dx}\right)dx}{34de} \\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} + \frac{1}{34}B\int \frac{\log(34c+34dx)}{c+dx}\,dx - \frac{(bB)\int \frac{\log(34c+34dx)}{a+bx}}{34d} \\
&= -\frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(34c+34dx)}{34d} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} + B\int \frac{\log\left(\frac{3}{-}\right.}{34c} \\
&= -\frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(34c+34dx)}{34d} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+34dx)}{34d} + \frac{B\,\mathrm{Subst}\left(\int\right.}{} \\
&= \frac{B\log^2(34(c+dx))}{68d} - \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(34c+34dx)}{34d} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(34c+}{34d}
\end{aligned}$$

Mathematica [A] time = 0.0317992, size = 95, normalized size = 1.25

$$\frac{\log(i(c+dx))\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)-2B\log\left(\frac{d(a+bx)}{ad-bc}\right)+2A+B\log(i(c+dx))\right)-2B\,\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2di}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x),x]
```

```
[Out] (Log[i*(c + d*x)]*(2*A - 2*B*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*B*Log[(e
*(a + b*x))/(c + d*x)] + B*Log[i*(c + d*x)]) - 2*B*PolyLog[2, (b*(c + d*x))
```

```
/(b*c - a*d)])/(2*d*i)
```

Maple [B] time = 0.056, size = 411, normalized size = 5.4

$$-\frac{Aa}{i(ad-bc)}\ln\left(d\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)-be\right)+\frac{Abc}{di(ad-bc)}\ln\left(d\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)-be\right)-\frac{Ba}{i(ad-bc)}\mathrm{dilog}\left(-\frac{1}{be}\left(d\left(\frac{be}{d}+\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] -1/i/(a*d-b*c)*A*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d/i/(a*d-b*c)*
A*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b*c-1/i/(a*d-b*c)*B*dilog(-(d*(b*
e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d/i/(a*d-b*c)*B*dilog(-(d*(b*e/d+(
a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-1/i/(a*d-b*c)*B*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d/i/(a*d-b*c)*B
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/
b/e)*b*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}B\left(\frac{\log(dx+c)^2}{di}-2\int\frac{\log(bx+a)+\log(e)}{dix+ci}\,dx\right)+\frac{A\log(dix+ci)}{di}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="maxima")
```

```
[Out] -1/2*B*(log(d*x + c)^2/(d*i) - 2*integrate((log(b*x + a) + log(e))/(d*i*x +
 c*i), x)) + A*log(d*i*x + c*i)/(d*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B\log\left(\frac{bex+ae}{dx+c}\right)+A}{dix+ci},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*e*x + a*e)/(d*x + c)) + A)/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i), x)
```

3.35 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=44

$$\frac{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2Bgi(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(2*B*(b*c - a*d)*g*i)
```

Rubi [C] time = 0.584468, antiderivative size = 304, normalized size of antiderivative = 6.91, number of steps used = 20, number of rules used = 9, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.225, Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{gi(bc-ad)}+\frac{B\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{gi(bc-ad)}+\frac{\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi(bc-ad)}-\frac{\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)),x]
```

```
[Out] -(B*Log[a + b*x]^2)/(2*(b*c - a*d)*g*i) + (Log[a + b*x]*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/((b*c - a*d)*g*i) + (B*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/((b*c - a*d)*g*i) - ((A + B*Log[(e*(a + b*x))/(c + d*x)])*Lo
g[c + d*x])/((b*c - a*d)*g*i) - (B*Log[c + d*x]^2)/(2*(b*c - a*d)*g*i) + (B
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (B*PolyLo
g[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)*g*i) + (B*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(35c+35dx)(ag+bgx)}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g(c+dx)}\right)dx$$

$$= \frac{b\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{35(bc-ad)g} - \frac{d\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{35(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+b}{(c+dx)}\right.}{e(}}{35(bc}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+b}{(c+dx)}\right.}{}}{35(bc}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} - \frac{B\int\left(\frac{be\log(a+bx)}{a+bx}\right.}{35(bc-}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{35(bc-ad)g} - \frac{(bB)\int \frac{\log(a+bx)}{a+bx}}{35(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} + \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{35(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad}$$

$$= -\frac{B\log^2(a+bx)}{70(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} + \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{35(bc-ad)g} - $$

$$= -\frac{B\log^2(a+bx)}{70(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{35(bc-ad)g} + \frac{B\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{35(bc-ad)g} - $$

Mathematica [C] time = 0.114315, size = 207, normalized size = 4.7

$$\frac{2B\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2B\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+2A\log(a+bx)+2B\log(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)-2B\log(c+dx)\log\left(\right.}{2gi(bc-}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)
),x]
```

```
[Out] (2*A*Log[a + b*x] - B*Log[a + b*x]^2 + 2*B*Log[a + b*x]*Log[(e*(a + b*x))/(
c + d*x)] - 2*A*Log[c + d*x] + 2*B*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c
+ d*x] - 2*B*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - B*Log[c + d*x]^2 +
 2*B*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 2*B*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)] + 2*B*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(2*(b*c -
 a*d)*g*i)
```

Maple [B] time = 0.052, size = 201, normalized size = 4.6

$$-\frac{Aad}{i\,(ad-bc)^2\,g}\ln\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)+\frac{Abc}{i\,(ad-bc)^2\,g}\ln\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)-\frac{Bad}{2\,i\,(ad-bc)^2\,g}\left(\ln\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)\right)^2+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] -d/i/(a*d-b*c)^2/g*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/i/(a*d-b*c)^2/g*A*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/2*d/i/(a*d-b*c)^2/g*B*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2*a+1/2/i/(a*d-b*c)^2/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2*b*c
```

Maxima [B] time = 1.17217, size = 232, normalized size = 5.27

$$B\left(\frac{\log\left(bx+a\right)}{(bc-ad)gi}-\frac{\log\left(dx+c\right)}{(bc-ad)gi}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+A\left(\frac{\log\left(bx+a\right)}{(bc-ad)gi}-\frac{\log\left(dx+c\right)}{(bc-ad)gi}\right)-\frac{\left(\log\left(bx+a\right)^{2}-2\,\log\left(bx+\right.\right.}{2\left(b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm
="maxima")
```

```
[Out] B*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x + c)/((b*c - a*d)*g*i))*log(b*e
*x/(d*x + c) + a*e/(d*x + c)) + A*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x
 + c)/((b*c - a*d)*g*i)) - 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c
) + log(d*x + c)^2)*B/(b*c*g*i - a*d*g*i)
```

Fricas [A] time = 0.493947, size = 126, normalized size = 2.86

$$\frac{B\log\left(\frac{bex+ae}{dx+c}\right)^{2}+2\,A\log\left(\frac{bex+ae}{dx+c}\right)}{2\,(bc-ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm
="fricas")
```

```
[Out] 1/2*(B*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*log((b*e*x + a*e)/(d*x + c)))/(
(b*c - a*d)*g*i)
```

Sympy [B] time = 1.5322, size = 170, normalized size = 3.86

$$A\left(\frac{\log\left(x+\frac{-\frac{a^{2}d^{2}}{ad-bc}+\frac{2abcd}{ad-bc}+ad-\frac{b^{2}c^{2}}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}-\frac{\log\left(x+\frac{\frac{a^{2}d^{2}}{ad-bc}-\frac{2abcd}{ad-bc}+ad+\frac{b^{2}c^{2}}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}\right)-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)^{2}}{2adgi-2bcgi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] A*(log(x + (-a**2*d**2/(a*d - b*c) + 2*a*b*c*d/(a*d - b*c) + a*d - b**2*c**
2/(a*d - b*c) + b*c)/(2*b*d))/(g*i*(a*d - b*c)) - log(x + (a**2*d**2/(a*d -
 b*c) - 2*a*b*c*d/(a*d - b*c) + a*d + b**2*c**2/(a*d - b*c) + b*c)/(2*b*d))
```

```
/(g*i*(a*d - b*c))) - B*log(e*(a + b*x)/(c + d*x))**2/(2*a*d*g*i - 2*b*c*g*
i)
```

Giac [B] time = 1.3858, size = 142, normalized size = 3.23

$$-\frac{Bi\log\left(\frac{bx+a}{dx+c}\right)^2}{2\left(bcg-adg\right)}-\frac{(Ai+Bi)\log\left(\left|\frac{2\,bdx+bc+ad-|-bc+ad|}{2\,bdx+bc+ad+|-bc+ad|}\right|\right)}{g|-bc+ad|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm
="giac")
```

```
[Out] -1/2*B*i*log((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - (A*i + B*i)*log(abs((
2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*
d))))/(g*abs(-b*c + a*d))
```

3.36 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=173

$$-\frac{d\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i(bc-ad)^2}-\frac{b(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i(a+bx)(bc-ad)^2}-\frac{bB(c+dx)}{g^2i(a+bx)(bc-ad)^2}+\frac{Bd\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2i(bc-ad)^2}$$

```
[Out] -((b*B*(c + d*x))/((b*c - a*d)^2*g^2*i*(a + b*x))) + (B*d*Log[(a + b*x)/(c
+ d*x)]^2)/(2*(b*c - a*d)^2*g^2*i) - (b*(c + d*x)*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (d*Log[(a + b*x)/(c + d*x)]*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^2*i)
```

Rubi [C] time = 0.703046, antiderivative size = 437, normalized size of antiderivative = 2.53, number of steps used = 24, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{Bd\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^2i(bc-ad)^2}-\frac{Bd\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^2i(bc-ad)^2}-\frac{d\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i(bc-ad)^2}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{g^2i(a+bx)(bc-ad)}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*x)),x]
```

```
[Out] -(B/((b*c - a*d)*g^2*i*(a + b*x))) - (B*d*Log[a + b*x])/((b*c - a*d)^2*g^2*
i) + (B*d*Log[a + b*x]^2)/(2*(b*c - a*d)^2*g^2*i) - (A + B*Log[(e*(a + b*x)
)/(c + d*x)])/((b*c - a*d)*g^2*i*(a + b*x)) - (d*Log[a + b*x]*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^2*i) + (B*d*Log[c + d*x])/((b*c -
 a*d)^2*g^2*i) - (B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c
 - a*d)^2*g^2*i) + (d*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((
b*c - a*d)^2*g^2*i) + (B*d*Log[c + d*x]^2)/(2*(b*c - a*d)^2*g^2*i) - (B*d*L
og[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (B*d*Po
lyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) - (B*d*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(36c+36dx)(ag+bgx)^2}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2(c+dx)}\right) d$$

$$= -\frac{(bd)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{36(bc-ad)^2g^2} + \frac{d^2\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{36(bc-ad)^2g^2} + \frac{b\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}dx}{36(bc-ad)g^2}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.}{36(bc-a}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.}{36(bc-a}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{36(bc-ad)^2g^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.}{36(bc-a}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(\right.}{36(b}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(\right.}{36(b}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} + \frac{Bd\log^2(a+bx)}{72(bc-ad)^2g^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx}$$

$$= -\frac{B}{36(bc-ad)g^2(a+bx)} - \frac{Bd\log(a+bx)}{36(bc-ad)^2g^2} + \frac{Bd\log^2(a+bx)}{72(bc-ad)^2g^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc-ad)g^2(a+bx}$$

Mathematica [C] time = 0.298984, size = 292, normalized size = 1.69

$$-\frac{-Bd(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bd(a+bx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx}{bc-ad}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*
x)),x]
```

```
[Out] -(2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d*(a + b*x)*Log[a
+ b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(a + b*x)*(A + B*Log[(e*(
a + b*x))/(c + d*x)])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b
*x] - d*(a + b*x)*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) + B*d*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x
])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*(b*c - a*d)^
2*g^2*i*(a + b*x))
```

Maple [B] time = 0.056, size = 605, normalized size = 3.5

$$-\frac{d^2Aa}{i\,(ad-bc)^3\,g^2}\ln\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)+\frac{dAbc}{i\,(ad-bc)^3\,g^2}\ln\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)-\frac{deAba}{i\,(ad-bc)^3\,g^2}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] -d^2/i/(a*d-b*c)^3/g^2*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d/i/(a*d-b*c)^3/
g^2*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-e*d/i/(a*d-b*c)^3/g^2*A*b/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e/i/(a*d-b*c)^3/g^2*A*b^2/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)*c-1/2*d^2/i/(a*d-b*c)^3/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^2*a+1/2*d/i/(a*d-b*c)^3/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c-e*
d/i/(a*d-b*c)^3/g^2*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*a+e/i/(a*d-b*c)^3/g^2*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-e*d/i/(a*d-b*c)^3/g^2*B*b/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e/i/(a*d-b*c)^3/g^2*B*b^2/(b*e/d+e/(d*x+c)*a-e
/d/(d*x+c)*b*c)*c
```

Maxima [B] time = 1.30179, size = 572, normalized size = 3.31

$$-B\left(\frac{1}{\left(b^2c-abd\right)g^2ix+\left(abc-a^2d\right)g^2i}+\frac{d\log\left(bx+a\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)g^2i}-\frac{d\log\left(dx+c\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)g^2i}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] -B*(1/((b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((
b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*
d + a^2*d^2)*g^2*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - A*(1/((b^2*c -
a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^2 - 2*a*b*
c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2
*i)) + 1/2*((b*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2
*b*c + 2*a*d - 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d
)*log(b*x + a))*log(d*x + c))*B/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*
d^2*g^2*i + (b^3*c^2*g^2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*i)*x)
```

Fricas [A] time = 0.509202, size = 329, normalized size = 1.9

$$-\frac{2\,(A+B)bc-2\,(A+B)ad+(Bbdx+Bad)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,((A+B)bdx+Bbc+Aad)\log\left(\frac{bex+ae}{dx+c}\right)}{2\left(\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)g^2ix+\left(ab^2c^2-2\,a^2bcd+a^3d^2\right)g^2i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] -1/2*(2*(A + B)*b*c - 2*(A + B)*a*d + (B*b*d*x + B*a*d)*log((b*e*x + a*e)/(
d*x + c))^2 + 2*((A + B)*b*d*x + B*b*c + A*a*d)*log((b*e*x + a*e)/(d*x + c)
))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*i*x + (a*b^2*c^2 - 2*a^2*b*c*d
+ a^3*d^2)*g^2*i)
```

Sympy [B] time = 3.0551, size = 386, normalized size = 2.23

$$-\frac{Bd\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^2d^2g^2i-4abcdg^2i+2b^2c^2g^2i}+\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a^2dg^2i-abcg^2i+abdg^2ix-b^2cg^2ix}+(A+B)\left(\frac{d\log\left(x+\frac{-\frac{a^3d^4}{(ad-bc)^2}+\frac{3a^2bcd^3}{(ad-bc)^2}-\frac{3ab^2c^2d^2}{(ad-bc)^2}}{2bd^2}\right.}{g^2i\,(ad-bc)^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2/(d*i*x+c*i),x)
```

```
[Out] -B*d*log(e*(a + b*x)/(c + d*x))**2/(2*a**2*d**2*g**2*i - 4*a*b*c*d*g**2*i +
 2*b**2*c**2*g**2*i) + B*log(e*(a + b*x)/(c + d*x))/(a**2*d*g**2*i - a*b*c*
g**2*i + a*b*d*g**2*i*x - b**2*c*g**2*i*x) + (A + B)*(d*log(x + (-a**3*d**4
/(a*d - b*c)**2 + 3*a**2*b*c*d**3/(a*d - b*c)**2 - 3*a*b**2*c**2*d**2/(a*d
- b*c)**2 + a*d**2 + b**3*c**3*d/(a*d - b*c)**2 + b*c*d)/(2*b*d**2))/(g**2*
i*(a*d - b*c)**2) - d*log(x + (a**3*d**4/(a*d - b*c)**2 - 3*a**2*b*c*d**3/(
a*d - b*c)**2 + 3*a*b**2*c**2*d**2/(a*d - b*c)**2 + a*d**2 - b**3*c**3*d/(a
*d - b*c)**2 + b*c*d)/(2*b*d**2))/(g**2*i*(a*d - b*c)**2) + 1/(a**2*d*g**2*
i - a*b*c*g**2*i + x*(a*b*d*g**2*i - b**2*c*g**2*i)))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{(bgx+ag)^2(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)
), x)
```

3.37 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=255

$$-\frac{b^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3}+\frac{d^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(bc-ad)^3}+\frac{2bd(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(a+bx)(bc-ad)^3}-\frac{Bd^2\log^2\left(\right.}{2g^3i(bc-\right.}$$

```
[Out] -(B*(c + d*x)^2*(b - (4*d*(a + b*x))/(c + d*x))^2)/(4*(b*c - a*d)^3*g^3*i*(
a + b*x)^2) - (B*d^2*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^3*g^3*i) +
(2*b*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^3*i
*(a + b*x)) - (b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*
c - a*d)^3*g^3*i*(a + b*x)^2) + (d^2*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^3*i)
```

Rubi [C] time = 0.877028, antiderivative size = 535, normalized size of antiderivative = 2.1, number of steps used = 28, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^3i(bc-ad)^3}+\frac{Bd^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^3i(bc-ad)^3}+\frac{d^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(bc-ad)^3}-\frac{d^2\log(c+dx)\left(B\log\left(\frac{e(a-}{c+}\right.\right.}{g^3i(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*x)),x]
```

```
[Out] -B/(4*(b*c - a*d)*g^3*i*(a + b*x)^2) + (3*B*d)/(2*(b*c - a*d)^2*g^3*i*(a +
b*x)) + (3*B*d^2*Log[a + b*x])/(2*(b*c - a*d)^3*g^3*i) - (B*d^2*Log[a + b*x
]^2)/(2*(b*c - a*d)^3*g^3*i) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*(b*c
 - a*d)*g^3*i*(a + b*x)^2) + (d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c
 - a*d)^2*g^3*i*(a + b*x)) + (d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/((b*c - a*d)^3*g^3*i) - (3*B*d^2*Log[c + d*x])/(2*(b*c - a*d)^3*g
^3*i) + (B*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)
^3*g^3*i) - (d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c -
 a*d)^3*g^3*i) - (B*d^2*Log[c + d*x]^2)/(2*(b*c - a*d)^3*g^3*i) + (B*d^2*Lo
g[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) + (B*d^2*P
olyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^3*i) + (B*d^2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(37c+37dx)(ag+bgx)^3}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)g^3(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)^2} + \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^3g^3(a+bx)} - \frac{d^3 \ldots}{3\ldots}\right.$$

$$= \frac{(bd^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{37(bc-ad)^3g^3} - \frac{d^3\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{37(bc-ad)^3g^3} - \frac{(bd)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}dx}{37(bc-ad)^2g^3} + \frac{b\int \frac{A+\ldots}{}}{37(\ldots}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{37(bc-ad)^3g^3}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{37(bc-ad)^3g^3}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{37(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{37(bc-ad)^3g^3}$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} - \frac{A+B\log}{74(bc-ad)g}$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} - \frac{A+B\log}{74(bc-ad)g}$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} - \frac{Bd^2\log^2(a+}{74(bc-ad)}$$

$$= -\frac{B}{148(bc-ad)g^3(a+bx)^2} + \frac{3Bd}{74(bc-ad)^2g^3(a+bx)} + \frac{3Bd^2\log(a+bx)}{74(bc-ad)^3g^3} - \frac{Bd^2\log^2(a+}{74(bc-ad)}$$

Mathematica [C] time = 0.378282, size = 418, normalized size = 1.64

$$\frac{-2Bd^2(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2Bd^2(a+bx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+}{bc-}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*
x)),x]
```

```
[Out] (-2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(b*c - a*d)*(a
 + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*Log[a + b*
x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*(A + B*Log[(e*(
a + b*x))/(c + d*x)])*Log[c + d*x] + 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*
x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*d*(-(b*c
) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log
[c + d*x]) - 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*B*d
^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c
+ d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^3*g^3*i*(
a + b*x)^2)
```

Maple [B] time = 0.055, size = 1040, normalized size = 4.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] -d^3/i/(a*d-b*c)^4/g^3*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^2/i/(a*d-b*c)^
4/g^3*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-2*e*d^2/i/(a*d-b*c)^4/g^3*A*b/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e*d/i/(a*d-b*c)^4/g^3*A*b^2/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+1/2*e^2*d/i/(a*d-b*c)^4/g^3*A*b^2/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2*e^2/i/(a*d-b*c)^4/g^3*A*b^3/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^2*c-1/2*d^3/i/(a*d-b*c)^4/g^3*B*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2*a+1/2*d^2/i/(a*d-b*c)^4/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2*b*c-2*e*d^2/i/(a*d-b*c)^4/g^3*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*e*d/i/(a*d-b*c)^4/g^3*B*b^2/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d^2/i/(a*d-b*c)
^4/g^3*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e*d/i/(a*d-b*c)^4/g^3*B*
b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+1/2*e^2*d/i/(a*d-b*c)^4/g^3*B*b^2
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/
2*e^2/i/(a*d-b*c)^4/g^3*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*c+1/4*e^2*d/i/(a*d-b*c)^4/g^3*B*b^2/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2/i/(a*d-b*c)^4/g^3*B*b^3/(b*e/d+e/(d*x+c)*
a-e/d/(d*x+c)*b*c)^2*c
```

Maxima [B] time = 1.5394, size = 1195, normalized size = 4.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] 1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i
*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2
*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d
 + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(b*e*x/(d*x + c) + a*e/(d*x +
c)) + 1/2*A*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c
^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3
*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i)) - 1/4*(b^2*c^2 - 8*a*b*c*d
+ 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b
^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*
x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2
 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*
x + a))*log(d*x + c))*B/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*
b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^
2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3
*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x)
```

Fricas [A] time = 0.48864, size = 732, normalized size = 2.87

$$-\frac{(2A+B)b^2c^2 - 8(A+B)abcd + (6A+7B)a^2d^2 - 2\left(Bb^2d^2x^2 + 2Babd^2x + Ba^2d^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 - 2\left((2A+3B)b^2c}{4\left(\left(b^5c^3 - 3ab^4c^2d + 3a^2b^3cd^2 - a^3b^2d^3\right)g^3ix^2 + 2\left(ab^4c^3 - 3a^2b^3c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] -1/4*((2*A + B)*b^2*c^2 - 8*(A + B)*a*b*c*d + (6*A + 7*B)*a^2*d^2 - 2*(B*b^
2*d^2*x^2 + 2*B*a*b*d^2*x + B*a^2*d^2)*log((b*e*x + a*e)/(d*x + c))^2 - 2*(
(2*A + 3*B)*b^2*c*d - (2*A + 3*B)*a*b*d^2)*x - 2*((2*A + 3*B)*b^2*d^2*x^2 -
 B*b^2*c^2 + 4*B*a*b*c*d + 2*A*a^2*d^2 + 2*(B*b^2*c*d + 2*(A + B)*a*b*d^2)*
x)*log((b*e*x + a*e)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^
2 - a^3*b^2*d^3)*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d
^2 - a^4*b*d^3)*g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 -
a^5*d^3)*g^3*i)
```

Sympy [B] time = 7.53382, size = 889, normalized size = 3.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] -B*d**2*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d**3*g**3*i - 6*a**2*b*c*d**2
*g**3*i + 6*a*b**2*c**2*d*g**3*i - 2*b**3*c**3*g**3*i) + d**2*(2*A + 3*B)*l
og(x + (2*A*a*d**3 + 2*A*b*c*d**2 + 3*B*a*d**3 + 3*B*b*c*d**2 - a**4*d**6*(
2*A + 3*B)/(a*d - b*c)**3 + 4*a**3*b*c*d**5*(2*A + 3*B)/(a*d - b*c)**3 - 6*
a**2*b**2*c**2*d**4*(2*A + 3*B)/(a*d - b*c)**3 + 4*a*b**3*c**3*d**3*(2*A +
3*B)/(a*d - b*c)**3 - b**4*c**4*d**2*(2*A + 3*B)/(a*d - b*c)**3)/(4*A*b*d**
3 + 6*B*b*d**3))/(2*g**3*i*(a*d - b*c)**3) - d**2*(2*A + 3*B)*log(x + (2*A*
a*d**3 + 2*A*b*c*d**2 + 3*B*a*d**3 + 3*B*b*c*d**2 + a**4*d**6*(2*A + 3*B)/(
a*d - b*c)**3 - 4*a**3*b*c*d**5*(2*A + 3*B)/(a*d - b*c)**3 + 6*a**2*b**2*c*
*2*d**4*(2*A + 3*B)/(a*d - b*c)**3 - 4*a*b**3*c**3*d**3*(2*A + 3*B)/(a*d -
b*c)**3 + b**4*c**4*d**2*(2*A + 3*B)/(a*d - b*c)**3)/(4*A*b*d**3 + 6*B*b*d*
*3))/(2*g**3*i*(a*d - b*c)**3) + (3*B*a*d - B*b*c + 2*B*b*d*x)*log(e*(a + b
*x)/(c + d*x))/(2*a**4*d**2*g**3*i - 4*a**3*b*c*d*g**3*i + 4*a**3*b*d**2*g*
*3*i*x + 2*a**2*b**2*c**2*g**3*i - 8*a**2*b**2*c*d*g**3*i*x + 2*a**2*b**2*d
**2*g**3*i*x**2 + 4*a*b**3*c**2*g**3*i*x - 4*a*b**3*c*d*g**3*i*x**2 + 2*b**
4*c**2*g**3*i*x**2) + (6*A*a*d - 2*A*b*c + 7*B*a*d - B*b*c + x*(4*A*b*d + 6
*B*b*d))/(4*a**4*d**2*g**3*i - 8*a**3*b*c*d*g**3*i + 4*a**2*b**2*c**2*g**3*
i + x**2*(4*a**2*b**2*d**2*g**3*i - 8*a*b**3*c*d*g**3*i + 4*b**4*c**2*g**3*
i) + x*(8*a**3*b*d**2*g**3*i - 16*a**2*b**2*c*d*g**3*i + 8*a*b**3*c**2*g**3
*i))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{\left(bgx + ag\right)^3 (dix + ci)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^3*(d*i*x + c*i)
), x)
```

3.38 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=373

$$\frac{3b^2d(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^4i(a+bx)^2(bc-ad)^4}-\frac{b^3(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4i(a+bx)^3(bc-ad)^4}-\frac{d^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i(bc-ad)^4}-\frac{3bd^2(c+}{g^4i}$$

```
[Out] (-3*b*B*d^2*(c + d*x))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B*d*(c + d*
x)^2)/(4*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (b^3*B*(c + d*x)^3)/(9*(b*c - a
*d)^4*g^4*i*(a + b*x)^3) + (B*d^3*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d
)^4*g^4*i) - (3*b*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c
 - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(2*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (b^3*(c + d*x)^3*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (d^3*L
og[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^
4*g^4*i)
```

Rubi [C] time = 1.07811, antiderivative size = 620, normalized size of antiderivative = 1.66, number of steps used = 32, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{Bd^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^4i(bc-ad)^4}-\frac{Bd^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^4i(bc-ad)^4}-\frac{d^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i(bc-ad)^4}+\frac{d^3\log(c+dx)\left(B\log\left(\frac{e(}{}\right.\right.}{g^4i(bc-ad)^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*x)),x]
```

```
[Out] -B/(9*(b*c - a*d)*g^4*i*(a + b*x)^3) + (5*B*d)/(12*(b*c - a*d)^2*g^4*i*(a +
 b*x)^2) - (11*B*d^2)/(6*(b*c - a*d)^3*g^4*i*(a + b*x)) - (11*B*d^3*Log[a +
 b*x])/(6*(b*c - a*d)^4*g^4*i) + (B*d^3*Log[a + b*x]^2)/(2*(b*c - a*d)^4*g^
4*i) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(3*(b*c - a*d)*g^4*i*(a + b*x)^
3) + (d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^4*i*(a + b
*x)^2) - (d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^4*i*(a
 + b*x)) - (d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c -
a*d)^4*g^4*i) + (11*B*d^3*Log[c + d*x])/(6*(b*c - a*d)^4*g^4*i) - (B*d^3*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^4*i) + (d^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^4*g^4*i) +
(B*d^3*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^4*i) - (B*d^3*Log[a + b*x]*Log[(b
*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) - (B*d^3*PolyLog[2, -((d*(a
 + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^4*i) - (B*d^3*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(38c+38dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)^3g^4(a+bx)^2} - \ldots$$

$$= -\frac{\left(bd^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{38(bc-ad)^4g^4} + \frac{d^4\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{38(bc-ad)^4g^4} + \frac{\left(bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{38(bc-ad)^3g^4} - \ldots$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{76(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)^3g^4(a+bx)} - \ldots$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{76(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)^3g^4(a+bx)} - \ldots$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{76(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{38(bc-ad)^3g^4(a+bx)} - \ldots$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(a+bx)} - \ldots$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(a+bx)} - \ldots$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(a+bx)} - \ldots$$

$$= -\frac{B}{342(bc-ad)g^4(a+bx)^3} + \frac{5Bd}{456(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2}{228(bc-ad)^3g^4(a+bx)} - \ldots$$

Mathematica [C] time = 0.724539, size = 492, normalized size = 1.32

$$-36Bd^3\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right) - 36Bd^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right) + \frac{36Ad^2(ad-bc)}{a+bx} + \frac{18Ad(bc-ad)^2}{(a+bx)^2} - \frac{12A(bc-ad)^3}{(a+bx)^3} - 36Ad^3\log(a+bx) \ldots$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*
x)),x]
```

```
[Out] ((-12*A*(b*c - a*d)^3)/(a + b*x)^3 - (4*B*(b*c - a*d)^3)/(a + b*x)^3 + (18*
A*d*(b*c - a*d)^2)/(a + b*x)^2 + (15*B*d*(b*c - a*d)^2)/(a + b*x)^2 + (36*A
*d^2*(-(b*c) + a*d))/(a + b*x) + (66*B*d^2*(-(b*c) + a*d))/(a + b*x) - 36*A
*d^3*Log[a + b*x] - 66*B*d^3*Log[a + b*x] + 18*B*d^3*Log[a + b*x]^2 - (12*B
*(b*c - a*d)^3*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^3 + (18*B*d*(b*c - a
*d)^2*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^2 + (36*B*d^2*(-(b*c) + a*d)*
Log[(e*(a + b*x))/(c + d*x)])/(a + b*x) - 36*B*d^3*Log[a + b*x]*Log[(e*(a +
 b*x))/(c + d*x)] + 36*A*d^3*Log[c + d*x] + 66*B*d^3*Log[c + d*x] - 36*B*d^
3*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 36*B*d^3*Log[(e*(a + b*x
))/(c + d*x)]*Log[c + d*x] + 18*B*d^3*Log[c + d*x]^2 - 36*B*d^3*Log[a + b*x
```

```
]*Log[(b*(c + d*x))/(b*c - a*d)] - 36*B*d^3*PolyLog[2, (d*(a + b*x))/(-(b*c
) + a*d)] - 36*B*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(36*(b*c - a*d)
^4*g^4*i)
```

Maple [B] time = 0.053, size = 1474, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] -d^4/i/(a*d-b*c)^5/g^4*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^3/i/(a*d-b*c)^
5/g^4*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-3*e*d^3/i/(a*d-b*c)^5/g^4*A*b/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+3*e*d^2/i/(a*d-b*c)^5/g^4*A*b^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3/2*e^2*d^2/i/(a*d-b*c)^5/g^4*A*b^2/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-3/2*e^2*d/i/(a*d-b*c)^5/g^4*A*b^3/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/3*e^3*d/i/(a*d-b*c)^5/g^4*A*b^3/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+1/3*e^3/i/(a*d-b*c)^5/g^4*A*b^4/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/2*d^4/i/(a*d-b*c)^5/g^4*B*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2*a+1/2*d^3/i/(a*d-b*c)^5/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^2*b*c-3*e*d^3/i/(a*d-b*c)^5/g^4*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*e*d^2/i/(a*d-b*c)^5/g^4*B*b^2/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3*e*d^3/i/(a*d-
b*c)^5/g^4*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+3*e*d^2/i/(a*d-b*c)^5/
g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3/2*e^2*d^2/i/(a*d-b*c)^5/g
^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*a-3/2*e^2*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+3/4*e^2*d^2/i/(a*d-b*c)^5/g^4*B*b^2/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-3/4*e^2*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/3*e^3*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/3*e^3
/i/(a*d-b*c)^5/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*c-1/9*e^3*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-
e/d/(d*x+c)*b*c)^3*a+1/9*e^3/i/(a*d-b*c)^5/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)^3*c
```

Maxima [B] time = 1.97217, size = 1983, normalized size = 5.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] -1/6*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^
4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g
^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*
g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i)
+ 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*
b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d +
6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*log(b*e*x/(d*x + c) +
```

```
a*e/(d*x + c)) - 1/6*A*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2
 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 -
 a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2
- a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d
^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 -
a^6*d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*
c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 -
4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i)) - 1/36
*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2
 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3
*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x +
a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x
 + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a
) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*
(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log
(d*x + c))*B/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2
*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3
*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^
4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g
^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*
i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i
 + a^6*b*d^4*g^4*i)*x)
```

Fricas [A] time = 0.558678, size = 1285, normalized size = 3.45

$$-\frac{4\,(3\,A+B)b^3c^3-27\,(2\,A+B)ab^2c^2d+108\,(A+B)a^2bcd^2-(66\,A+85\,B)a^3d^3+6\left(\left(6\,A+11\,B\right)b^3cd^2-\left(6\,A+11\,B\right)ab\right.}{36\left(\left(b^7c^4-4\,ab^6c^3d+6\,a^2b^5\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] -1/36*(4*(3*A + B)*b^3*c^3 - 27*(2*A + B)*a*b^2*c^2*d + 108*(A + B)*a^2*b*c
*d^2 - (66*A + 85*B)*a^3*d^3 + 6*((6*A + 11*B)*b^3*c*d^2 - (6*A + 11*B)*a*b
^2*d^3)*x^2 + 18*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x^2 + 3*B*a^2*b*d^3*x + B*a
^3*d^3)*log((b*e*x + a*e)/(d*x + c))^2 - 3*((6*A + 5*B)*b^3*c^2*d - 18*(2*A
 + 3*B)*a*b^2*c*d^2 + (30*A + 49*B)*a^2*b*d^3)*x + 6*((6*A + 11*B)*b^3*d^3*
x^3 + 2*B*b^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2 + 6*A*a^3*d^3 + 3*(2
*B*b^3*c*d^2 + 3*(2*A + 3*B)*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*d - 6*B*a*b^2*c*
d^2 - 6*(A + B)*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^7*c^4 - 4*a
*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*i*x^3 +
 3*(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5
*b^2*d^4)*g^4*i*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2
- 4*a^5*b^2*c*d^3 + a^6*b*d^4)*g^4*i*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6
*a^5*b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4*i)
```

Sympy [B] time = 22.1794, size = 1392, normalized size = 3.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

```
[Out] -B*d**3*log(e*(a + b*x)/(c + d*x))**2/(2*a**4*d**4*g**4*i - 8*a**3*b*c*d**3
*g**4*i + 12*a**2*b**2*c**2*d**2*g**4*i - 8*a*b**3*c**3*d*g**4*i + 2*b**4*c
**4*g**4*i) + d**3*(6*A + 11*B)*log(x + (6*A*a*d**4 + 6*A*b*c*d**3 + 11*B*a
*d**4 + 11*B*b*c*d**3 - a**5*d**8*(6*A + 11*B)/(a*d - b*c)**4 + 5*a**4*b*c*
d**7*(6*A + 11*B)/(a*d - b*c)**4 - 10*a**3*b**2*c**2*d**6*(6*A + 11*B)/(a*d
 - b*c)**4 + 10*a**2*b**3*c**3*d**5*(6*A + 11*B)/(a*d - b*c)**4 - 5*a*b**4*
c**4*d**4*(6*A + 11*B)/(a*d - b*c)**4 + b**5*c**5*d**3*(6*A + 11*B)/(a*d -
b*c)**4)/(12*A*b*d**4 + 22*B*b*d**4))/(6*g**4*i*(a*d - b*c)**4) - d**3*(6*A
 + 11*B)*log(x + (6*A*a*d**4 + 6*A*b*c*d**3 + 11*B*a*d**4 + 11*B*b*c*d**3 +
 a**5*d**8*(6*A + 11*B)/(a*d - b*c)**4 - 5*a**4*b*c*d**7*(6*A + 11*B)/(a*d
- b*c)**4 + 10*a**3*b**2*c**2*d**6*(6*A + 11*B)/(a*d - b*c)**4 - 10*a**2*b*
*3*c**3*d**5*(6*A + 11*B)/(a*d - b*c)**4 + 5*a*b**4*c**4*d**4*(6*A + 11*B)/
(a*d - b*c)**4 - b**5*c**5*d**3*(6*A + 11*B)/(a*d - b*c)**4)/(12*A*b*d**4 +
 22*B*b*d**4))/(6*g**4*i*(a*d - b*c)**4) + (11*B*a**2*d**2 - 7*B*a*b*c*d +
15*B*a*b*d**2*x + 2*B*b**2*c**2 - 3*B*b**2*c*d*x + 6*B*b**2*d**2*x**2)*log(
e*(a + b*x)/(c + d*x))/(6*a**6*d**3*g**4*i - 18*a**5*b*c*d**2*g**4*i + 18*a
**5*b*d**3*g**4*i*x + 18*a**4*b**2*c**2*d*g**4*i - 54*a**4*b**2*c*d**2*g**4
*i*x + 18*a**4*b**2*d**3*g**4*i*x**2 - 6*a**3*b**3*c**3*g**4*i + 54*a**3*b*
*3*c**2*d*g**4*i*x - 54*a**3*b**3*c*d**2*g**4*i*x**2 + 6*a**3*b**3*d**3*g**
4*i*x**3 - 18*a**2*b**4*c**3*g**4*i*x + 54*a**2*b**4*c**2*d*g**4*i*x**2 - 1
8*a**2*b**4*c*d**2*g**4*i*x**3 - 18*a*b**5*c**3*g**4*i*x**2 + 18*a*b**5*c**
2*d*g**4*i*x**3 - 6*b**6*c**3*g**4*i*x**3) + (66*A*a**2*d**2 - 42*A*a*b*c*d
 + 12*A*b**2*c**2 + 85*B*a**2*d**2 - 23*B*a*b*c*d + 4*B*b**2*c**2 + x**2*(3
6*A*b**2*d**2 + 66*B*b**2*d**2) + x*(90*A*a*b*d**2 - 18*A*b**2*c*d + 147*B*
a*b*d**2 - 15*B*b**2*c*d))/(36*a**6*d**3*g**4*i - 108*a**5*b*c*d**2*g**4*i
+ 108*a**4*b**2*c**2*d*g**4*i - 36*a**3*b**3*c**3*g**4*i + x**3*(36*a**3*b*
*3*d**3*g**4*i - 108*a**2*b**4*c*d**2*g**4*i + 108*a*b**5*c**2*d*g**4*i - 3
6*b**6*c**3*g**4*i) + x**2*(108*a**4*b**2*d**3*g**4*i - 324*a**3*b**3*c*d**
2*g**4*i + 324*a**2*b**4*c**2*d*g**4*i - 108*a*b**5*c**3*g**4*i) + x*(108*a
**5*b*d**3*g**4*i - 324*a**4*b**2*c*d**2*g**4*i + 324*a**3*b**3*c**2*d*g**4
*i - 108*a**2*b**4*c**3*g**4*i))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{\left(bgx+ag\right)^4(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^4*(d*i*x + c*i)
), x)
```

3.39 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=341

$$-\frac{3bBg^3(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^2}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{2d^2i^2(c+dx)}-\frac{bg^3(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\Big(}{2d}$$

```
[Out] (3*B*(b*c - a*d)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) - ((6*A + 5*B)*(b*c -
 a*d)^2*g^3*(a + b*x))/(2*d^3*i^2*(c + d*x)) - (3*B*(b*c - a*d)^2*g^3*(a +
b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d^3*i^2*(c + d*x)) + (g^3*(a + b*x)^3*(
A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d*i^2*(c + d*x)) - ((b*c - a*d)*g^3
*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^2*(c +
d*x)) - (b*(b*c - a*d)^2*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 5*B + 6*
B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^4*i^2) - (3*b*B*(b*c - a*d)^2*g^3*Pol
yLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2)
```

Rubi [A] time = 0.727061, antiderivative size = 519, normalized size of antiderivative = 1.52, number of steps used = 22, number of rules used = 14, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{3bBg^3(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^4i^2}-\frac{a^2bBg^3\log(a+bx)}{2d^2i^2}+\frac{b^3g^3x^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^2i^2}-\frac{Ab^2g^3x(2bc-3ad)}{d^3i^2}+\frac{g^3(}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^2,
x]
```

```
[Out] -((A*b^2*(2*b*c - 3*a*d)*g^3*x)/(d^3*i^2)) - (b^2*B*(b*c - a*d)*g^3*x)/(2*d
^3*i^2) - (B*(b*c - a*d)^3*g^3)/(d^4*i^2*(c + d*x)) - (a^2*b*B*g^3*Log[a +
b*x])/(2*d^2*i^2) - (b*B*(b*c - a*d)^2*g^3*Log[a + b*x])/(d^4*i^2) - (b*B*(
2*b*c - 3*a*d)*g^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d^3*i^2) + (b^3
*g^3*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^2) + ((b*c - a*d)^3
*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i^2*(c + d*x)) + (b^3*B*c^2
*g^3*Log[c + d*x])/(2*d^4*i^2) + (b*B*(2*b*c - 3*a*d)*(b*c - a*d)*g^3*Log[c
 + d*x])/(d^4*i^2) + (b*B*(b*c - a*d)^2*g^3*Log[c + d*x])/(d^4*i^2) - (3*b*
B*(b*c - a*d)^2*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^
2) + (3*b*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*
x])/(d^4*i^2) + (3*b*B*(b*c - a*d)^2*g^3*Log[c + d*x]^2)/(2*d^4*i^2) - (3*b
*B*(b*c - a*d)^2*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
```

```
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(39c+39dx)^2}\,dx = \int \left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1521d^3} + \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1521d^2} + \frac{(-$$

$$= \frac{\left(b^3g^3\right)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{1521d^2} - \frac{\left(b^2(2bc-3ad)g^3\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{1521d^3}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} + \frac{b^3g^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3042d^2} + \frac{(bc-ad)^3g^3\left(A+B\log\right.}{1521d^4(c+dx}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{bB(2bc-3ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1521d^3} + \frac{b^3g^3x^2\left(A+B\right.}{304}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{bB(2bc-3ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1521d^3} + \frac{b^3g^3x^2\left(A+B\right.}{304}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} - \frac{a^2bBg^3\log(a+b}{3042d^2}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} - \frac{a^2bBg^3\log(a+b}{3042d^2}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} - \frac{a^2bBg^3\log(a+b}{3042d^2}$$

$$= -\frac{Ab^2(2bc-3ad)g^3x}{1521d^3} - \frac{b^2B(bc-ad)g^3x}{3042d^3} - \frac{B(bc-ad)^3g^3}{1521d^4(c+dx)} - \frac{a^2bBg^3\log(a+b}{3042d^2}$$

Mathematica [A] time = 0.42726, size = 359, normalized size = 1.05

$$g^3\left(-3bB(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+bB\left(b\left(dx(ad-bc)+bc^2\log\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x)^2,x]
```

```
[Out] (g^3*(-2*A*b^2*d*(2*b*c - 3*a*d)*x - 2*b*B*d*(2*b*c - 3*a*d)*(a + b*x)*Log[
(e*(a + b*x))/(c + d*x)] + b^3*d^2*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
 + (2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 2*b*B
*(2*b*c - 3*a*d)*(b*c - a*d)*Log[c + d*x] + 6*b*(b*c - a*d)^2*(A + B*Log[(e
*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*B*(b*c - a*d)^2*((b*c - a*d)/(c +
d*x) + b*Log[a + b*x] - b*Log[c + d*x]) + b*B*(-(a^2*d^2*Log[a + b*x]) + b*
(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*b*B*(b*c - a*d)^2*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(2*d^4*i^2)
```

Maple [B] time = 0.174, size = 2973, normalized size = 8.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)
```

```
[Out] -1/d*A*g^3/i^2*a^3/(d*x+c)+1/d*B*g^3/i^2*a^3/(d*x+c)-1/d^2*A*g^3/i^2*a^2*b+
1/d^4*B*g^3/i^2*b^3*c^2+2*e^2/d^3*B*g^3/i^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a/(d*x+c)^2*c^3-3*e^2/d^2*B*g^3/i^2*b^
3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+
c)^2*c^2-9*e/d^2*B*g^3/i^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)*c/(d*x+c)*a^2+9*e/d^3*B*g^3/i^2*b^3*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2/(d*x+c)*a+2*e^2/d*B*g^3/i^2*b^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+
c)^2*c-3*e/d^4*B*g^3/i^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)*c^3/(d*x+c)+3*e/d*B*g^3/i^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)-1/2*e^2/d^4*B*g^3/i^2*b^5*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2-6
*e/d^3*B*g^3/i^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)*c*a-e^2/d^3*B*g^3/i^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^2*c*a-3/d^2*B*g^3/i^2*b*dilog(-(d*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))-b*e)/b/e)*a^2+1/d^4*A*g^3/i^2*b^3*c^3/(d*x+c)-1/d^4*B*g^3/i^2*b^3
*c^3/(d*x+c)-3/d^4*B*g^3/i^2*b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*
e)/b/e)*c^2-5/2/d^2*B*g^3/i^2*b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2
-5/2/d^4*B*g^3/i^2*b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2-3/d^2*A*
g^3/i^2*b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-1/d^4*B*g^3/i^2*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c^2-1/d^2*B*g^3/i^2*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*a^2*b-1/d*B*g^3/i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^3/(d*x+c)-3/d
^4*A*g^3/i^2*b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2-1/d^4*A*g^3/i^
2*b^3*c^2-3/d^2*B*g^3/i^2*a^2/(d*x+c)*b*c+3/d^3*B*g^3/i^2*b^2*c^2/(d*x+c)*a
+1/d^4*B*g^3/i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c^3/(d*x+c)-3/d^2*B*g^
3/i^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-b*e)/b/e)*a^2+2/d^3*A*g^3/i^2*a*b^2*c-2/d^3*B*g^3/i^2*b^2*c*a+3*e/d^4*A*g
```

```
^3/i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+1/2*e/d^2*B*g^3/i^2*b^2/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)*a^2+1/2*e/d^4*B*g^3/i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)*c^2+6/d^3*B*g^3/i^2*b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)
/b/e)*a*c-3/d^3*A*g^3/i^2*a/(d*x+c)*b^2*c^2+5/d^3*B*g^3/i^2*b^2*ln(d*(b*e/d
+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*c+1/2*e^2/d^2*A*g^3/i^2*b^3/(d*e/(d*x+c)*a-e
/(d*x+c)*b*c)^2*a^2+1/2*e^2/d^4*A*g^3/i^2*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
^2*c^2+3*e/d^2*A*g^3/i^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-3/d^4*B*g^3/
i^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-b*e)/b/e)*c^2+2/d^3*B*g^3/i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c*a+6/d
^3*A*g^3/i^2*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c*a+3/d^2*A*g^3/i^
2*a^2/(d*x+c)*b*c+1/d^2*B*g^3/i^2*b*a^2-6*e/d^3*A*g^3/i^2*b^3/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)*a*c-e/d^3*B*g^3/i^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c-
e^2/d^3*A*g^3/i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c-1/2*e^2*B*g^3/i^2
*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x
+c)^2+6/d^3*B*g^3/i^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*
d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*c-3/d^3*B*g^3/i^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*b^2*c^2/(d*x+c)*a+3/d^2*B*g^3/i^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*
c/(d*x+c)*a^2+3*e/d^4*B*g^3/i^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d
*x+c)*a-e/(d*x+c)*b*c)*c^2+3*e/d^2*B*g^3/i^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2+1/2*e^2/d^4*B*g^3/i^2*b^5*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2+1/2*e^2/d^2*B*g^
3/i^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a
^2
```

Maxima [B] time = 1.5938, size = 1810, normalized size = 5.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] 1/2*(2*c^3/(d^5*i^2*x + c*d^4*i^2) + 6*c^2*log(d*x + c)/(d^4*i^2) + (d*x^2
- 4*c*x)/(d^3*i^2))*A*b^3*g^3 - 3*A*a*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/
(d^2*i^2) + 2*c*log(d*x + c)/(d^3*i^2))*g^3 + 3*A*a^2*b*g^3*(c/(d^3*i^2*x +
 c*d^2*i^2) + log(d*x + c)/(d^2*i^2)) - B*a^3*g^3*(log(b*e*x/(d*x + c) + a*
e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2*x + c*d*i^2) - b*log(b*x +
a)/((b*c*d - a*d^2)*i^2) + b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A*a^3*g^
3/(d^2*i^2*x + c*d*i^2) - 1/2*(6*a^3*b*d^3*g^3*log(e) - (6*g^3*log(e) + 7*g
^3)*b^4*c^3 + (18*g^3*log(e) + 17*g^3)*a*b^3*c^2*d - 6*(3*g^3*log(e) + 2*g^
3)*a^2*b^2*c*d^2)*B*log(d*x + c)/(b*c*d^4*i^2 - a*d^5*i^2) + 1/2*((b^4*c*d^
3*g^3*log(e) - a*b^3*d^4*g^3*log(e))*B*x^3 - ((3*g^3*log(e) + g^3)*b^4*c^2*
d^2 - (9*g^3*log(e) + 2*g^3)*a*b^3*c*d^3 + (6*g^3*log(e) + g^3)*a^2*b^2*d^4
)*B*x^2 - ((4*g^3*log(e) + g^3)*b^4*c^3*d - 2*(5*g^3*log(e) + g^3)*a*b^3*c^
2*d^2 + (6*g^3*log(e) + g^3)*a^2*b^2*c*d^3)*B*x - 3*((b^4*c^3*d*g^3 - 3*a*b
^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3 - a^3*b*d^4*g^3)*B*x + (b^4*c^4*g^3 -
3*a*b^3*c^3*d*g^3 + 3*a^2*b^2*c^2*d^2*g^3 - a^3*b*c*d^3*g^3)*B)*log(d*x + c
)^2 + 2*((g^3*log(e) - g^3)*b^4*c^4 - 4*(g^3*log(e) - g^3)*a*b^3*c^3*d + 6*
(g^3*log(e) - g^3)*a^2*b^2*c^2*d^2 - 3*(g^3*log(e) - g^3)*a^3*b*c*d^3)*B +
((b^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2*d^2*g^3 - 3*a*b^3*c*d^3
*g^3 + 2*a^2*b^2*d^4*g^3)*B*x^2 - (6*b^4*c^3*d*g^3 - 12*a*b^3*c^2*d^2*g^3 +
 3*a^2*b^2*c*d^3*g^3 + 5*a^3*b*d^4*g^3)*B*x - (6*a*b^3*c^3*d*g^3 - 15*a^2*b
^2*c^2*d^2*g^3 + 11*a^3*b*c*d^3*g^3)*B)*log(b*x + a) - ((b^4*c*d^3*g^3 - a*
b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2*d^2*g^3 - 3*a*b^3*c*d^3*g^3 + 2*a^2*b^2*d^4
*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g^3 - 5*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^
3)*B*x + 2*(b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 3*a^3
```

```
*b*c*d^3*g^3)*B)*log(d*x + c))/(b*c^2*d^4*i^2 - a*c*d^5*i^2 + (b*c*d^5*i^2
- a*d^6*i^2)*x) + 3*(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3)*(log(b*
x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d
)))*B/(d^4*i^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{Ab^3g^3x^3 + 3\,Aab^2g^3x^2 + 3\,Aa^2bg^3x + Aa^3g^3 + \left(Bb^3g^3x^3 + 3\,Bab^2g^3x^2 + 3\,Ba^2bg^3x + Ba^3g^3\right)\log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2},\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] integral((A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3 +
 (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((b*e
*x + a*e)/(d*x + c)))/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{(dix + ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i)^
2, x)
```

3.40 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=260

$$\frac{2bBg^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}+\frac{bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+B\right)}{d^3i^2}+\frac{g^2(2A+B)(a+bx)(bc-}{d^2i^2(c+dx)}$$

```
[Out] (-2*B*(b*c - a*d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) + ((2*A + B)*(b*c - a*
d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B*(b*c - a*d)*g^2*(a + b*x)*Log[
(e*(a + b*x))/(c + d*x)])/(d^2*i^2*(c + d*x)) + (g^2*(a + b*x)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(d*i^2*(c + d*x)) + (b*(b*c - a*d)*g^2*Log[(b*c
 - a*d)/(b*(c + d*x))]*(2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i
^2) + (2*b*B*(b*c - a*d)*g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*
i^2)
```

Rubi [A] time = 0.532412, antiderivative size = 336, normalized size of antiderivative = 1.29, number of steps used = 18, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2bBg^2(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^3i^2}-\frac{g^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^2(c+dx)}-\frac{2bg^2(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right.}{d^3i^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^2,
x]
```

```
[Out] (A*b^2*g^2*x)/(d^2*i^2) + (B*(b*c - a*d)^2*g^2)/(d^3*i^2*(c + d*x)) + (b*B*
(b*c - a*d)*g^2*Log[a + b*x])/(d^3*i^2) + (b*B*g^2*(a + b*x)*Log[(e*(a + b*
x))/(c + d*x)])/(d^2*i^2) - ((b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(d^3*i^2*(c + d*x)) - (2*b*B*(b*c - a*d)*g^2*Log[c + d*x])/(d^3*i
^2) + (2*b*B*(b*c - a*d)*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]
)/(d^3*i^2) - (2*b*(b*c - a*d)*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[c + d*x])/(d^3*i^2) - (b*B*(b*c - a*d)*g^2*Log[c + d*x]^2)/(d^3*i^2) + (2*
b*B*(b*c - a*d)*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(40c+40dx)^2}\,dx = \int\left(\frac{b^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1600d^2}+\frac{(-bc+ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1600d^2(c+dx)^2}-\frac{b(bc-\ldots}{\ldots}\right.$$

$$=\frac{\left(b^2g^2\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{1600d^2}-\frac{\left(b(bc-ad)g^2\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{800d^2}+\frac{\left((bc-\ldots\right.}{\ldots}$$

$$=\frac{Ab^2g^2x}{1600d^2}-\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1600d^3(c+dx)}-\frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{800d^3}$$

$$=\frac{Ab^2g^2x}{1600d^2}+\frac{bBg^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1600d^2}-\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1600d^3(c+dx)}-\frac{b(\ldots}{\ldots}$$

$$=\frac{Ab^2g^2x}{1600d^2}+\frac{bBg^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{1600d^2}-\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1600d^3(c+dx)}-\frac{bB\ldots}{\ldots}$$

$$=\frac{Ab^2g^2x}{1600d^2}+\frac{B(bc-ad)^2g^2}{1600d^3(c+dx)}+\frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3}+\frac{bBg^2(a+bx)\log\left(\frac{e(\ldots}{c\ldots}\right.}{1600d^2}$$

$$=\frac{Ab^2g^2x}{1600d^2}+\frac{B(bc-ad)^2g^2}{1600d^3(c+dx)}+\frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3}+\frac{bBg^2(a+bx)\log\left(\frac{e(\ldots}{c\ldots}\right.}{1600d^2}$$

$$=\frac{Ab^2g^2x}{1600d^2}+\frac{B(bc-ad)^2g^2}{1600d^3(c+dx)}+\frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3}+\frac{bBg^2(a+bx)\log\left(\frac{e(\ldots}{c\ldots}\right.}{1600d^2}$$

$$=\frac{Ab^2g^2x}{1600d^2}+\frac{B(bc-ad)^2g^2}{1600d^3(c+dx)}+\frac{bB(bc-ad)g^2\log(a+bx)}{1600d^3}+\frac{bBg^2(a+bx)\log\left(\frac{e(\ldots}{c\ldots}\right.}{1600d^2}$$

Mathematica [A] time = 0.244676, size = 239, normalized size = 0.92

$$\frac{g^2\left(bB(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2b(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a\ldots}{c\ldots}\right.\right.\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x)^2,x]
```

```
[Out] (g^2*(A*b^2*d*x + (B*(b*c - a*d)^2)/(c + d*x) + b*B*(b*c - a*d)*Log[a + b*x
] + b*B*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - ((b*c - a*d)^2*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(c + d*x) - 2*b*B*(b*c - a*d)*Log[c + d*x] - 2
```

```
*b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + b*B*(b*c
 - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(d^3*i^2)
```

Maple [B] time = 0.171, size = 1382, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)
```

```
[Out] e/d*g^2/i^2*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)/(d*x+c)*a^2+2/d^2*g^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*
c-1/d*g^2/i^2*A/(d*x+c)*a^2+1/d*g^2/i^2*B/(d*x+c)*a^2+e/d^3*g^2/i^2*B*b^3*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2+2/
d^3*g^2/i^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))-b*e)/b/e)*c-1/d^3*g^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*
x+c)*b^2*c^2-2/d^2*g^2/i^2*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+e/d^2*g^2/i^2*A*b^2/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)*a-e/d^3*g^2/i^2*A*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c+2/d^2*g^2
/i^2*A/(d*x+c)*a*b*c-2/d^2*g^2/i^2*B/(d*x+c)*a*b*c-2*e/d^2*g^2/i^2*B*b^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*c-e/d
^3*g^2/i^2*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)*c+e/d^2*g^2/i^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)*a+1/d^3*g^2/i^2*B/(d*x+c)*b^2*c^2-1/d^2*g^2/i^2*A*b*a+1/d^3*g^
2/i^2*A*b^2*c+1/d^2*g^2/i^2*B*b*a-1/d^3*g^2/i^2*B*b^2*c+1/d^3*g^2/i^2*B*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-1/d^3*g^2/i^2*A/(d*x+c)*b^2*c^2+2/d^3*g^
2/i^2*A*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-2/d^2*g^2/i^2*A*b*ln(
d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a-1/d^2*g^2/i^2*B*b*ln(d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-b*e)*a+1/d^3*g^2/i^2*B*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-b*e)*c+2/d^3*g^2/i^2*B*b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)
/b/e)*c-1/d*g^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-1/d^2*g^2
/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2/d^2*g^2/i^2*B*b*dilog(-(d*(b*e
/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a
```

Maxima [B] time = 1.53016, size = 1196, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] -A*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x + c)/(d^3*i
^2))*g^2 + 2*A*a*b*g^2*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i^2))
 - B*a^2*g^2*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) -
1/(d^2*i^2*x + c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*log(d*x
+ c)/((b*c*d - a*d^2)*i^2)) - A*a^2*g^2/(d^2*i^2*x + c*d*i^2) - (2*a^2*b*d^
2*g^2*log(e) + 2*(g^2*log(e) + g^2)*b^3*c^2 - (4*g^2*log(e) + 3*g^2)*a*b^2*
c*d)*B*log(d*x + c)/(b*c*d^3*i^2 - a*d^4*i^2) + ((b^3*c*d^2*g^2*log(e) - a*
b^2*d^3*g^2*log(e))*B*x^2 + (b^3*c^2*d*g^2*log(e) - a*b^2*c*d^2*g^2*log(e))
*B*x + ((b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 + a^2*b*d^3*g^2)*B*x + (b^3*c^3*
```

```
g^2 - 2*a*b^2*c^2*d*g^2 + a^2*b*c*d^2*g^2)*B)*log(d*x + c)^2 - ((g^2*log(e)
 - g^2)*b^3*c^3 - 3*(g^2*log(e) - g^2)*a*b^2*c^2*d + 2*(g^2*log(e) - g^2)*a
^2*b*c*d^2)*B + ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (2*b^3*c^2*d*g^2 -
 2*a*b^2*c*d^2*g^2 - a^2*b*d^3*g^2)*B*x + (2*a*b^2*c^2*d*g^2 - 3*a^2*b*c*d^
2*g^2)*B)*log(b*x + a) - ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (b^3*c^2*
d*g^2 - a*b^2*c*d^2*g^2)*B*x - (b^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 2*a^2*b*c
*d^2*g^2)*B)*log(d*x + c))/(b*c^2*d^3*i^2 - a*c*d^4*i^2 + (b*c*d^4*i^2 - a*
d^5*i^2)*x) - 2*(b^2*c*g^2 - a*b*d*g^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*
c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^3*i^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^2g^2x^2 + 2\,Aabg^2x + Aa^2g^2 + \left(Bb^2g^2x^2 + 2\,Babg^2x + Ba^2g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*
a*b*g^2*x + B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/(d^2*i^2*x^2 + 2*c*d*i
^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{(dix + ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i)^
2, x)
```

3.41 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=160

$$-\frac{bBg\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^2}-\frac{Ag(a+bx)}{di^2(c+dx)}-\frac{Bg(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{di^2(c+dx)}+\frac{Bg(a+}{di^2(c+}$$

```
[Out] -((A*g*(a + b*x))/(d*i^2*(c + d*x))) + (B*g*(a + b*x))/(d*i^2*(c + d*x)) -
(B*g*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d*i^2*(c + d*x)) - (b*g*Log[(
b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i^2) -
 (b*B*g*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i^2)
```

Rubi [A] time = 0.403279, antiderivative size = 222, normalized size of antiderivative = 1.39, number of steps used = 15, number of rules used = 11, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.29, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{bBg\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2i^2}+\frac{bg\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^2}+\frac{g(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^2(c+dx)}-\frac{Bg(bc-ad)}{d^2i^2(c+dx)}-$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^2,x]
```

```
[Out] -((B*(b*c - a*d)*g)/(d^2*i^2*(c + d*x))) - (b*B*g*Log[a + b*x])/(d^2*i^2) +
 ((b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i^2*(c + d*x)) +
 (b*B*g*Log[c + d*x])/(d^2*i^2) - (b*B*g*Log[-((d*(a + b*x))/(b*c - a*d))]*
Log[c + d*x])/(d^2*i^2) + (b*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
 d*x])/(d^2*i^2) + (b*B*g*Log[c + d*x]^2)/(2*d^2*i^2) - (b*B*g*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/(d^2*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(41c+41dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d(c+dx)^2}+\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d(c+dx)}\right)dx$$

$$= \frac{(bg)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{1681d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}dx}{1681d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{1681d^2} - \frac{(bE}{}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{1681d^2} - \frac{(B}{}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)}{1681d^2} - \frac{(B}{}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bB}{}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bB}{}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bB}{}$$

$$= -\frac{B(bc-ad)g}{1681d^2(c+dx)} - \frac{bBg\log(a+bx)}{1681d^2} + \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1681d^2(c+dx)} + \frac{bB}{}$$

Mathematica [A] time = 0.162783, size = 175, normalized size = 1.09

$$\frac{g\left(-bB\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2b\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\cdots\right.}{2d^2i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x
)^2,x]
```

```
[Out] (g*((2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 2*b*(A
 + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*B*((b*c - a*d)/(c + d*x
) + b*Log[a + b*x] - b*Log[c + d*x]) - b*B*((2*Log[(d*(a + b*x))/(-(b*c) +
a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])))/(2*d^2*i^2)
```

Maple [B] time = 0.061, size = 978, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)
```

```
[Out] -1/d*g/(a*d-b*c)/i^2*A*b*a+1/d^2*g/(a*d-b*c)/i^2*A*b^2*c-g/(a*d-b*c)/i^2*A/
(d*x+c)*a^2+2/d*g/(a*d-b*c)/i^2*A/(d*x+c)*a*b*c-1/d^2*g/(a*d-b*c)/i^2*A/(d*
x+c)*b^2*c^2-1/d*g/(a*d-b*c)/i^2*A*b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e
)*a+1/d^2*g/(a*d-b*c)/i^2*A*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-1
/d*g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+1/d^2*g/(a*d-b*c)/
i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2/d*g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*x+c)*a*b*c-1/d^2*g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*x+c)*b^2*c^2+1/d*g/(a*d-b*c)/i^2*B*b*a-1/d^2*g/(a*d-b*c)/i^2*B*b^2*
c+g/(a*d-b*c)/i^2*B/(d*x+c)*a^2-2/d*g/(a*d-b*c)/i^2*B/(d*x+c)*a*b*c+1/d^2*g
/(a*d-b*c)/i^2*B/(d*x+c)*b^2*c^2-1/d*g/(a*d-b*c)/i^2*B*b*dilog(-(d*(b*e/d+(
a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*g/(a*d-b*c)/i^2*B*b^2*dilog(-(d*(b*
e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-1/d*g/(a*d-b*c)/i^2*B*b*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*
g/(a*d-b*c)/i^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*
c)*e/d/(d*x+c))-b*e)/b/e)*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,Bbg\left(\frac{(dx+c)\log(dx+c)^2+2\,c\log(dx+c)}{d^3i^2x+cd^2i^2}-2\int\frac{dx\log(bx+a)+dx\log(e)+c}{d^3i^2x^2+2\,cd^2i^2x+c^2di^2}\,dx\right)+Abg\left(\frac{c}{d^3i^2x+cd^2i^2}+\frac{\log(d}{d^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorit
hm="maxima")
```

```
[Out] -1/2*B*b*g*(((d*x + c)*log(d*x + c)^2 + 2*c*log(d*x + c))/(d^3*i^2*x + c*d^
2*i^2) - 2*integrate((d*x*log(b*x + a) + d*x*log(e) + c)/(d^3*i^2*x^2 + 2*c
*d^2*i^2*x + c^2*d*i^2), x)) + A*b*g*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x +
 c)/(d^2*i^2)) - B*a*g*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c
*d*i^2) - 1/(d^2*i^2*x + c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) +
b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A*a*g/(d^2*i^2*x + c*d*i^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2+2\,cdi^2x+c^2i^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorit
hm="fricas")
```

```
[Out] integral((A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((b*e*x + a*e)/(d*x + c)))
/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{(dix + ci)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorit
hm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i)^2,
 x)
```

3.42 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=98

$$\frac{A(a+bx)}{i^2(c+dx)(bc-ad)}+\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{i^2(c+dx)(bc-ad)}-\frac{B(a+bx)}{i^2(c+dx)(bc-ad)}$$

```
[Out] (A*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) - (B*(a + b*x))/((b*c - a*d)*i^2*
(c + d*x)) + (B*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)*i^2*(c
 + d*x))
```

Rubi [A] time = 0.0729925, antiderivative size = 101, normalized size of antiderivative = 1.03, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{di^2(c+dx)}+\frac{bB\log(a+bx)}{di^2(bc-ad)}-\frac{bB\log(c+dx)}{di^2(bc-ad)}+\frac{B}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^2,x]
```

```
[Out] B/(d*i^2*(c + d*x)) + (b*B*Log[a + b*x])/(d*(b*c - a*d)*i^2) - (A + B*Log[(
e*(a + b*x))/(c + d*x)])/(d*i^2*(c + d*x)) - (b*B*Log[c + d*x])/(d*(b*c - a
*d)*i^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(42c+42dx)^2}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} + \frac{B\int \frac{bc-ad}{42(a+bx)(c+dx)^2}\,dx}{42d}$$
$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} + \frac{(B(bc-ad))\int \frac{1}{(a+bx)(c+dx)^2}\,dx}{1764d}$$
$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} + \frac{(B(bc-ad))\int \left(\frac{b^2}{(bc-ad)^2(a+bx)} - \frac{d}{(bc-ad)(c+dx)^2} - \frac{bd}{(bc-ad)^2(c+dx)}\right)dx}{1764d}$$
$$= \frac{B}{1764d(c+dx)} + \frac{bB\log(a+bx)}{1764d(bc-ad)} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c+dx)} - \frac{bB\log(c+dx)}{1764d(bc-ad)}$$

Mathematica [A] time = 0.0482936, size = 104, normalized size = 1.06

$$\frac{-aAd+B(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)-bB(c+dx)\log(a+bx)+aBd+Abc+bBc\log(c+dx)+bBdx\log(c+dx)-bBc}{di^2(c+dx)(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^2,x]
```

```
[Out] (A*b*c - b*B*c - a*A*d + a*B*d - b*B*(c + d*x)*Log[a + b*x] + B*(b*c - a*d)
*Log[(e*(a + b*x))/(c + d*x)] + b*B*c*Log[c + d*x] + b*B*d*x*Log[c + d*x])/
(d*(-(b*c) + a*d)*i^2*(c + d*x))
```

Maple [B] time = 0.05, size = 515, normalized size = 5.3

$$-\frac{Aba}{(ad-bc)^2 i^2} + \frac{Ab^2c}{d(ad-bc)^2 i^2} - \frac{dAa^2}{(ad-bc)^2 i^2 (dx+c)} + 2\frac{Abac}{(ad-bc)^2 i^2 (dx+c)} - \frac{Ab^2c^2}{d(ad-bc)^2 i^2 (dx+c)} - \frac{Bba}{(ad-bc)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)
```

```
[Out] -1/(a*d-b*c)^2/i^2*A*b*a+1/d/(a*d-b*c)^2/i^2*A*b^2*c-d/(a*d-b*c)^2/i^2*A/(d
*x+c)*a^2+2/(a*d-b*c)^2/i^2*A/(d*x+c)*a*b*c-1/d/(a*d-b*c)^2/i^2*A/(d*x+c)*b
^2*c^2-1/(a*d-b*c)^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+1/d/(a*d-b*c
)^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-d/(a*d-b*c)^2/i^2*B*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2/(a*d-b*c)^2/i^2*B*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))/(d*x+c)*a*b*c-1/d/(a*d-b*c)^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*x+c)*b^2*c^2+d/(a*d-b*c)^2/i^2*B/(d*x+c)*a^2-2/(a*d-b*c)^2/i^2*B/
(d*x+c)*a*b*c+1/d/(a*d-b*c)^2/i^2*B/(d*x+c)*b^2*c^2+1/(a*d-b*c)^2/i^2*B*b*a
-1/d/(a*d-b*c)^2/i^2*B*b^2*c
```

Maxima [A] time = 1.22939, size = 181, normalized size = 1.85

$$-B\left(\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{d^2i^2x+cdi^2} - \frac{1}{d^2i^2x+cdi^2} - \frac{b\log(bx+a)}{\left(bcd-ad^2\right)i^2} + \frac{b\log(dx+c)}{\left(bcd-ad^2\right)i^2}\right) - \frac{A}{d^2i^2x+cdi^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="maxima")
```

```
[Out] -B*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2
*x + c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*log(d*x + c)/((b*c
*d - a*d^2)*i^2)) - A/(d^2*i^2*x + c*d*i^2)
```

Fricas [A] time = 0.477514, size = 177, normalized size = 1.81

$$-\frac{(A-B)bc-(A-B)ad-(Bbdx+Bad)\log\left(\frac{bex+ae}{dx+c}\right)}{\left(bcd^2-ad^3\right)i^2x+\left(bc^2d-acd^2\right)i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="fricas")
```

```
[Out] -((A - B)*b*c - (A - B)*a*d - (B*b*d*x + B*a*d)*log((b*e*x + a*e)/(d*x + c)
))/((b*c*d^2 - a*d^3)*i^2*x + (b*c^2*d - a*c*d^2)*i^2)
```

Sympy [B] time = 1.69012, size = 231, normalized size = 2.36

$$\frac{Bb\log\left(x+\frac{-\frac{Ba^2bd^2}{ad-bc}+\frac{2Bab^2cd}{ad-bc}+Babd-\frac{Bb^3c^2}{ad-bc}+Bb^2c}{2Bb^2d}\right)}{di^2\left(ad-bc\right)}-\frac{Bb\log\left(x+\frac{\frac{Ba^2bd^2}{ad-bc}-\frac{2Bab^2cd}{ad-bc}+Babd+\frac{Bb^3c^2}{ad-bc}+Bb^2c}{2Bb^2d}\right)}{di^2\left(ad-bc\right)}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{cdi^2+d^2i^2x}-\frac{A-B}{cdi^2+d^2i^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**2,x)
```

```
[Out] B*b*log(x + (-B*a**2*b*d**2/(a*d - b*c) + 2*B*a*b**2*c*d/(a*d - b*c) + B*a*
b*d - B*b**3*c**2/(a*d - b*c) + B*b**2*c)/(2*B*b**2*d))/(d*i**2*(a*d - b*c)
) - B*b*log(x + (B*a**2*b*d**2/(a*d - b*c) - 2*B*a*b**2*c*d/(a*d - b*c) + B
*a*b*d + B*b**3*c**2/(a*d - b*c) + B*b**2*c)/(2*B*b**2*d))/(d*i**2*(a*d - b
*c)) - B*log(e*(a + b*x)/(c + d*x))/(c*d*i**2 + d**2*i**2*x) - (A - B)/(c*d
*i**2 + d**2*i**2*x)
```

Giac [A] time = 1.3797, size = 116, normalized size = 1.18

$$-\frac{Bb\log\left(bx+a\right)}{bcd-ad^2}+\frac{Bb\log\left(dx+c\right)}{bcd-ad^2}+\frac{B\log\left(\frac{bx+a}{dx+c}\right)}{d^2x+cd}+\frac{A}{d^2x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] -B*b*log(b*x + a)/(b*c*d - a*d^2) + B*b*log(d*x + c)/(b*c*d - a*d^2) + B*lo
g((b*x + a)/(d*x + c))/(d^2*x + c*d) + A/(d^2*x + c*d)
```

3.43 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=156

$$\frac{b\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2Bgi^2(bc-ad)^2}-\frac{Ad(a+bx)}{gi^2(c+dx)(bc-ad)^2}-\frac{Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^2(c+dx)(bc-ad)^2}+\frac{Bd(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

```
[Out] -((A*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x))) + (B*d*(a + b*x))/((b*c
- a*d)^2*g*i^2*(c + d*x)) - (B*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((
b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(2*B*(b*c - a*d)^2*g*i^2)
```

Rubi [C] time = 0.713646, antiderivative size = 432, normalized size of antiderivative = 2.77, number of steps used = 24, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44}

$$\frac{bB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{gi^2(bc-ad)^2}+\frac{bB\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{gi^2(bc-ad)^2}+\frac{b\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi^2(bc-ad)^2}+\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{gi^2(c+dx)(bc-ad)}-\frac{b\,\mathrm{l}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)^2),x]
```

```
[Out] -(B/((b*c - a*d)*g*i^2*(c + d*x))) - (b*B*Log[a + b*x])/((b*c - a*d)^2*g*i^
2) - (b*B*Log[a + b*x]^2)/(2*(b*c - a*d)^2*g*i^2) + (A + B*Log[(e*(a + b*x)
)/(c + d*x)])/((b*c - a*d)*g*i^2*(c + d*x)) + (b*Log[a + b*x]*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g*i^2) + (b*B*Log[c + d*x])/((b*c -
 a*d)^2*g*i^2) + (b*B*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c
 - a*d)^2*g*i^2) - (b*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((
b*c - a*d)^2*g*i^2) - (b*B*Log[c + d*x]^2)/(2*(b*c - a*d)^2*g*i^2) + (b*B*L
og[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (b*B*Po
lyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) + (b*B*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(43c+43dx)^2(ag+bgx)}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)g(c+dx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g(c+dx)}\right)$$

$$= \frac{b^2\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{1849(bc-ad)^2g} - \frac{(bd)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{1849(bc-ad)^2g} - \frac{d\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}dx}{1849(bc-ad)g}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{1849(bc-}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{1849(bc-}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1849(bc-ad)^2g} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{1849(bc-}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} + \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+b}{1}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} + \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc-ad)g(c+dx)} + \frac{b\log(a+b}{1}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} - \frac{bB\log^2(a+bx)}{3698(bc-ad)^2g} + \frac{A+B\log\left(\frac{e(a+}{c+a}\right.}{1849(bc-ad)g(c}$$

$$= -\frac{B}{1849(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)}{1849(bc-ad)^2g} - \frac{bB\log^2(a+bx)}{3698(bc-ad)^2g} + \frac{A+B\log\left(\frac{e(a+}{c+a}\right.}{1849(bc-ad)g(c}$$

Mathematica [C] time = 0.288676, size = 292, normalized size = 1.87

$$\frac{-bB(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bB(c+dx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)
^2),x]
```

```
[Out] (2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*(c + d*x)*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b*(c + d*x)*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[c + d*x] - 2*B*(b*c - a*d + b*(c + d*x)*Log[a + b*
x] - b*(c + d*x)*Log[c + d*x]) - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) + b*B*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x]
)*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*(b*c - a*d)^2
*g*i^2*(c + d*x))
```

Maple [B] time = 0.053, size = 759, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] -d/i^2/(a*d-b*c)^3/g*A*b*a+1/i^2/(a*d-b*c)^3/g*A*b^2*c-d^2/i^2/(a*d-b*c)^3/
g*A/(d*x+c)*a^2+2*d/i^2/(a*d-b*c)^3/g*A/(d*x+c)*a*b*c-1/i^2/(a*d-b*c)^3/g*A
/(d*x+c)*b^2*c^2+d/i^2/(a*d-b*c)^3/g*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-
1/i^2/(a*d-b*c)^3/g*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-d/i^2/(a*d-b*c)
^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+1/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*b^2*c-d^2/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))/(d*x+c)*a^2+2*d/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*x+c)*a*b*c-1/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+
c)*b^2*c^2+d^2/i^2/(a*d-b*c)^3/g*B/(d*x+c)*a^2-2*d/i^2/(a*d-b*c)^3/g*B/(d*x
+c)*a*b*c+1/i^2/(a*d-b*c)^3/g*B/(d*x+c)*b^2*c^2+d/i^2/(a*d-b*c)^3/g*B*b*a-1
/i^2/(a*d-b*c)^3/g*B*b^2*c+1/2*d/i^2/(a*d-b*c)^3/g*B*b*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2*a-1/2/i^2/(a*d-b*c)^3/g*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
^2*c
```

Maxima [B] time = 1.2849, size = 568, normalized size = 3.64

$$B\left(\frac{1}{\left(bcd-ad^2\right)gi^2x+\left(bc^2-acd\right)gi^2}+\frac{b\log\left(bx+a\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)gi^2}-\frac{b\log\left(dx+c\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)gi^2}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+A$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="maxima")
```

```
[Out] B*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b
^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d
 + a^2*d^2)*g*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + A*(1/((b*c*d - a
*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 - 2*a*b*c
*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^
2)) - 1/2*((b*d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*
b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)
*log(b*x + a))*log(d*x + c))*B/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d
^2*g*i^2 + (b^2*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x)
```

Fricas [A] time = 0.511147, size = 328, normalized size = 2.1

$$\frac{2\,(A-B)bc-2\,(A-B)ad+(Bbdx+Bbc)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,((A-B)bdx+Abc-Bad)\log\left(\frac{bex+ae}{dx+c}\right)}{2\left(\left(b^2c^2d-2\,abcd^2+a^2d^3\right)gi^2x+\left(b^2c^3-2\,abc^2d+a^2cd^2\right)gi^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="fricas")
```

```
[Out] 1/2*(2*(A - B)*b*c - 2*(A - B)*a*d + (B*b*d*x + B*b*c)*log((b*e*x + a*e)/(d
*x + c))^2 + 2*((A - B)*b*d*x + A*b*c - B*a*d)*log((b*e*x + a*e)/(d*x + c))
)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g*i^2*x + (b^2*c^3 - 2*a*b*c^2*d + a
^2*c*d^2)*g*i^2)
```

Sympy [B] time = 3.11933, size = 386, normalized size = 2.47

$$\frac{Bb\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^2d^2gi^2-4abcdgi^2+2b^2c^2gi^2}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{acdgi^2+ad^2gi^2x-bc^2gi^2-bcdgi^2x}+(A-B)\left(-\frac{b\log\left(x+\frac{-\frac{a^3bd^3}{(ad-bc)^2}+\frac{3a^2b^2cd^2}{(ad-bc)^2}-\frac{3ab^3c^2d}{(ad-bc)^2}+}{2b^2d}\right.}{gi^2\,(ad-bc)^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] B*b*log(e*(a + b*x)/(c + d*x))**2/(2*a**2*d**2*g*i**2 - 4*a*b*c*d*g*i**2 +
2*b**2*c**2*g*i**2) - B*log(e*(a + b*x)/(c + d*x))/(a*c*d*g*i**2 + a*d**2*g
*i**2*x - b*c**2*g*i**2 - b*c*d*g*i**2*x) + (A - B)*(-b*log(x + (-a**3*b*d*
*3/(a*d - b*c)**2 + 3*a**2*b**2*c*d**2/(a*d - b*c)**2 - 3*a*b**3*c**2*d/(a*
d - b*c)**2 + a*b*d + b**4*c**3/(a*d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**
2*(a*d - b*c)**2) + b*log(x + (a**3*b*d**3/(a*d - b*c)**2 - 3*a**2*b**2*c*d
**2/(a*d - b*c)**2 + 3*a*b**3*c**2*d/(a*d - b*c)**2 + a*b*d - b**4*c**3/(a*
d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**2*(a*d - b*c)**2) - 1/(a*c*d*g*i**2
 - b*c**2*g*i**2 + x*(a*d**2*g*i**2 - b*c*d*g*i**2)))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{(bgx+ag)(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)*(d*i*x + c*i)^2
), x)
```

3.44 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=261

$$-\frac{b^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2bd\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(bc-ad)^3}-\frac{b^2B(c}{g^2i^2(a+bx}$$

```
[Out] -((B*d^2*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x))) - (b^2*B*(c + d*x))/
((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (b*B*d*Log[(a + b*x)/(c + d*x)]^2)/((b*
c - a*d)^3*g^2*i^2) + (d^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (b^2*(c + d*x)*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*b*d*Log[(a + b*x)/(c +
 d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^2)
```

Rubi [C] time = 0.867815, antiderivative size = 462, normalized size of antiderivative = 1.77, number of steps used = 28, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2bBd\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3}-\frac{2bBd\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3}-\frac{2bd\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(bc-ad)^3}-\frac{b\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.}{g^2i^2(a+bx)(bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*x)^2),
x]
```

```
[Out] -((b*B)/((b*c - a*d)^2*g^2*i^2*(a + b*x))) + (B*d)/((b*c - a*d)^2*g^2*i^2*(
c + d*x)) + (b*B*d*Log[a + b*x]^2)/((b*c - a*d)^3*g^2*i^2) - (b*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (d*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (2*b*d*Log
[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^2) - (
2*b*B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g^2*
i^2) + (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*
d)^3*g^2*i^2) + (b*B*d*Log[c + d*x]^2)/((b*c - a*d)^3*g^2*i^2) - (2*b*B*d*L
og[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) - (2*b*
B*d*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^2*i^2) - (2*
b*B*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(44c+44dx)^2(ag+bgx)^2}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)^2} - \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{968(bc-ad)^3g^2(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(c+dx)}\right.$$

$$= -\frac{(b^2d)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{968(bc-ad)^3g^2} + \frac{(bd^2)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{968(bc-ad)^3g^2} + \frac{b^2\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}dx}{1936(bc-ad)^2g^2} + \frac{d^2}{1}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx)\left(A+B\log\left(\frac{e}{}\right.\right.}{968(bc-ad)^3g^2}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx)\left(A+B\log\left(\frac{e}{}\right.\right.}{968(bc-ad)^3g^2}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx)\left(A+B\log\left(\frac{e}{}\right.\right.}{968(bc-ad)^3g^2}$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} -$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc-ad)^2g^2(a+bx)} -$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} + \frac{bBd\log^2(a+bx)}{1936(bc-ad)^3g^2} - \frac{b\left(A+\right.}{1936(bc}$$

$$= -\frac{bB}{1936(bc-ad)^2g^2(a+bx)} + \frac{Bd}{1936(bc-ad)^2g^2(c+dx)} + \frac{bBd\log^2(a+bx)}{1936(bc-ad)^3g^2} - \frac{b\left(A+\right.}{1936(bc}$$

Mathematica [C] time = 0.452001, size = 324, normalized size = 1.24

$$bBd\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-bBd\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\,\mathrm{l}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*
x)^2),x]
```

```
[Out] (-((b^2*B*c)/(a + b*x)) + (a*b*B*d)/(a + b*x) + (b*B*c*d)/(c + d*x) - (a*B*
d^2)/(c + d*x) - (b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a +
b*x) + (d*(-(b*c) + a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) -
2*b*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*d*(A + B*Log[
(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + b*B*d*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) - b*B*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c
+ d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^3*g^2*i^2)
```

Maple [B] time = 0.053, size = 1187, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] e*d/i^2/(a*d-b*c)^4/g^2*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*a+2*d^2/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*x+c)*a*b*c-e/i^2/(a*d-b*c)^4/g^2*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/
(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+d^3/i^2/(a*d-b*c)^4/g^2*B/(d
*x+c)*a^2-d^3/i^2/(a*d-b*c)^4/g^2*A/(d*x+c)*a^2+e*d/i^2/(a*d-b*c)^4/g^2*A*b
^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-d^2/i^2/(a*d-b*c)^4/g^2*A*b*a-d/i^
2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2+d/i^2/(
a*d-b*c)^4/g^2*A*b^2*c+d^2/i^2/(a*d-b*c)^4/g^2*B*b*a-d/i^2/(a*d-b*c)^4/g^2*
B*b^2*c-d/i^2/(a*d-b*c)^4/g^2*A/(d*x+c)*b^2*c^2-e/i^2/(a*d-b*c)^4/g^2*B*b^3
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+2*d^2/i^2/(a*d-b*c)^4/g^2*A/(d*x+c)*
a*b*c+e*d/i^2/(a*d-b*c)^4/g^2*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e
/i^2/(a*d-b*c)^4/g^2*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+d/i^2/(a*d
-b*c)^4/g^2*B/(d*x+c)*b^2*c^2-2*d/i^2/(a*d-b*c)^4/g^2*A*b^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*c+2*d^2/i^2/(a*d-b*c)^4/g^2*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*a+d^2/i^2/(a*d-b*c)^4/g^2*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-d^2
/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-d/i^2/(a*d-b*c)^
4/g^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+d/i^2/(a*d-b*c)^4/g^2*B*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-d^3/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*x+c)*a^2-2*d^2/i^2/(a*d-b*c)^4/g^2*B/(d*x+c)*a*b*c
```

Maxima [B] time = 1.42633, size = 1160, normalized size = 4.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] -B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^2*
x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*c^
3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*
a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^3*
c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2))*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - A*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 +
 a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g
^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x
 + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d
*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2)
) - (b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*
b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x
)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*
x)*log(d*x + c)^2)*B/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^2*i^2 + 3*a^3*b
*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 - 3*a*b^3*c^2*d^2
*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2 + (b^4*c^4*g^2*
i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^4*g^2*i^2)*x)
```

Fricas [A] time = 0.515332, size = 686, normalized size = 2.63

$$-\frac{(A+B)b^2c^2 - 2\,Babcd - (A-B)a^2d^2 + \left(Bb^2d^2x^2 + Babcd + \left(Bb^2cd + Babd^2\right)x\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\,(Ab^2cd - Aabd^2)x}{\left(b^4c^3d - 3\,ab^3c^2d^2 + 3\,a^2b^2cd^3 - a^3bd^4\right)g^2i^2x^2 + (b^4c^4 - 2\,ab^3c^3d + 2\,a^3bcd^3 - a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] -((A + B)*b^2*c^2 - 2*B*a*b*c*d - (A - B)*a^2*d^2 + (B*b^2*d^2*x^2 + B*a*b*
c*d + (B*b^2*c*d + B*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*b^2*
c*d - A*a*b*d^2)*x + (2*A*b^2*d^2*x^2 + B*b^2*c^2 + 2*A*a*b*c*d - B*a^2*d^2
 + 2*((A + B)*b^2*c*d + (A - B)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c)))/(
(b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*i^2*x^2 + (
b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^2*i^2*x + (a*b^3*c^4 -
 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*g^2*i^2)
```

Sympy [B] time = 7.05368, size = 828, normalized size = 3.17

$$-\frac{2Abd\log\left(x+\frac{-\frac{2Aa^4bd^5}{(ad-bc)^3}+\frac{8Aa^3b^2cd^4}{(ad-bc)^3}-\frac{12Aa^2b^3c^2d^3}{(ad-bc)^3}+\frac{8Aab^4c^3d^2}{(ad-bc)^3}+2Aabd^2-\frac{2Ab^5c^4d}{(ad-bc)^3}+2Ab^2cd}{4Ab^2d^2}\right)}{g^2i^2\left(ad-bc\right)^3}+\frac{2Abd\log\left(x+\frac{\frac{2Aa^4bd^5}{(ad-bc)^3}-\frac{8Aa^3b^2cd^4}{(ad-bc)^3}+\frac{12Aa^2b^3c^2d^3}{(ad-bc)^3}-\cdots}{4Ab^2\cdots}\right)}{g^2i^2\left(ad-bc\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)
```

```
[Out] -2*A*b*d*log(x + (-2*A*a**4*b*d**5/(a*d - b*c)**3 + 8*A*a**3*b**2*c*d**4/(a
*d - b*c)**3 - 12*A*a**2*b**3*c**2*d**3/(a*d - b*c)**3 + 8*A*a*b**4*c**3*d*
*2/(a*d - b*c)**3 + 2*A*a*b*d**2 - 2*A*b**5*c**4*d/(a*d - b*c)**3 + 2*A*b**
2*c*d)/(4*A*b**2*d**2))/(g**2*i**2*(a*d - b*c)**3) + 2*A*b*d*log(x + (2*A*a
**4*b*d**5/(a*d - b*c)**3 - 8*A*a**3*b**2*c*d**4/(a*d - b*c)**3 + 12*A*a**2
*b**3*c**2*d**3/(a*d - b*c)**3 - 8*A*a*b**4*c**3*d**2/(a*d - b*c)**3 + 2*A*
a*b*d**2 + 2*A*b**5*c**4*d/(a*d - b*c)**3 + 2*A*b**2*c*d)/(4*A*b**2*d**2))/
(g**2*i**2*(a*d - b*c)**3) + B*b*d*log(e*(a + b*x)/(c + d*x))**2/(a**3*d**3
*g**2*i**2 - 3*a**2*b*c*d**2*g**2*i**2 + 3*a*b**2*c**2*d*g**2*i**2 - b**3*c
**3*g**2*i**2) + (-B*a*d - B*b*c - 2*B*b*d*x)*log(e*(a + b*x)/(c + d*x))/(a
**3*c*d**2*g**2*i**2 + a**3*d**3*g**2*i**2*x - 2*a**2*b*c**2*d*g**2*i**2 -
a**2*b*c*d**2*g**2*i**2*x + a**2*b*d**3*g**2*i**2*x**2 + a*b**2*c**3*g**2*i
**2 - a*b**2*c**2*d*g**2*i**2*x - 2*a*b**2*c*d**2*g**2*i**2*x**2 + b**3*c**
3*g**2*i**2*x + b**3*c**2*d*g**2*i**2*x**2) - (A*a*d + A*b*c + 2*A*b*d*x -
B*a*d + B*b*c)/(a**3*c*d**2*g**2*i**2 - 2*a**2*b*c**2*d*g**2*i**2 + a*b**2*
c**3*g**2*i**2 + x**2*(a**2*b*d**3*g**2*i**2 - 2*a*b**2*c*d**2*g**2*i**2 +
b**3*c**2*d*g**2*i**2) + x*(a**3*d**3*g**2*i**2 - a**2*b*c*d**2*g**2*i**2 -
 a*b**2*c**2*d*g**2*i**2 + b**3*c**3*g**2*i**2))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{\left(bgx+ag\right)^2\left(dix+ci\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)
^2), x)
```

3.45 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=364

$$-\frac{b^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^2(a+bx)(bc-ad)^4}+\frac{3bd^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^2(bc-ad)^4}-\frac{d^3(a+}{g}$$

```
[Out] (B*d^3*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*B*d*(c + d*x))
/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*(c + d*x)^2)/(4*(b*c - a*d)^4*g
^3*i^2*(a + b*x)^2) - (3*b*B*d^2*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)
^4*g^3*i^2) - (d^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c -
a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d*x)^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2) + (3*b*d^2*
Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)
^4*g^3*i^2)
```

Rubi [C] time = 1.11731, antiderivative size = 630, normalized size of antiderivative = 1.73, number of steps used = 32, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3bBd^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4}+\frac{3bBd^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4}+\frac{3bd^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^2(bc-ad)^4}+\frac{d^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{g^3i^2(c+dx)(bc-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*x)^2),
x]
```

```
[Out] -(b*B)/(4*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (5*b*B*d)/(2*(b*c - a*d)^3*g
^3*i^2*(a + b*x)) - (B*d^2)/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*B*d^2*
Log[a + b*x])/(2*(b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*Log[a + b*x]^2)/(2*(b*
c - a*d)^4*g^3*i^2) - (b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*
d)^2*g^3*i^2*(a + b*x)^2) + (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((
b*c - a*d)^3*g^3*i^2*(a + b*x)) + (d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*d^2*Log[a + b*x]*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*Log[c + d*x])/(
2*(b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log
[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*d^2*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*Log[c + d*x]^2)/
(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
- a*d)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*PolyLog[2, -((d*(a + b*x))/(b
*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(45c+45dx)^2(ag+bgx)^3}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^2g^3(a+bx)^3} - \frac{2b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)^2} + \frac{b^2d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{675(bc-ad)^4g^3(a+b\right.$$

$$= \frac{\left(b^2d^2\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{675(bc-ad)^4g^3} - \frac{\left(bd^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{675(bc-ad)^4g^3} - \frac{\left(2b^2d\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{2025(bc-ad)^3g^3} -$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(c+dx)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(c+dx)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc-ad)^3g^3(c+dx)}$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{Bd^2}{2025(bc-ad)^3g^3(c+dx)} +$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{Bd^2}{2025(bc-ad)^3g^3(c+dx)} +$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{Bd^2}{2025(bc-ad)^3g^3(c+dx)} +$$

$$= -\frac{bB}{8100(bc-ad)^2g^3(a+bx)^2} + \frac{bBd}{810(bc-ad)^3g^3(a+bx)} - \frac{Bd^2}{2025(bc-ad)^3g^3(c+dx)} +$$

Mathematica [C] time = 0.790855, size = 453, normalized size = 1.24

$$\frac{-6bBd^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+6bBd^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*
x)^2),x]
```

```
[Out] (-((b*B*(b*c - a*d)^2)/(a + b*x)^2) + (8*b^2*B*c*d)/(a + b*x) - (8*a*b*B*d^
2)/(a + b*x) + (2*b*B*d*(b*c - a*d))/(a + b*x) - (4*b*B*c*d^2)/(c + d*x) +
(4*a*B*d^3)/(c + d*x) + 6*b*B*d^2*Log[a + b*x] - (2*b*(b*c - a*d)^2*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (8*b*d*(b*c - a*d)*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(a + b*x) + (4*d^2*(b*c - a*d)*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(c + d*x) + 12*b*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b
*x))/(c + d*x)]) - 6*b*B*d^2*Log[c + d*x] - 12*b*d^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x] - 6*b*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log
```

```
[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
+ 6*b*B*d^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d
*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^4*g^3*i^2)
```

Maple [B] time = 0.056, size = 1635, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] -d^4/i^2/(a*d-b*c)^5/g^3*A/(d*x+c)*a^2+d^4/i^2/(a*d-b*c)^5/g^3*B/(d*x+c)*a^
2+2*d^3/i^2/(a*d-b*c)^5/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c
-1/2*e^2*d/i^2/(a*d-b*c)^5/g^3*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*e*d^2/i^2/(a*d-b*c)^5/g^3*B*b^2/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-3*e*d/i^2/(a
*d-b*c)^5/g^3*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*c+1/2*e^2/i^2/(a*d-b*c)^5/g^3*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-d^2/i^2/(a*d-b*c)^5/g^3*B*b^2
*c-d^3/i^2/(a*d-b*c)^5/g^3*A*b*a+d^2/i^2/(a*d-b*c)^5/g^3*A*b^2*c+1/4*e^2/i^
2/(a*d-b*c)^5/g^3*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/2*e^2/i^2
/(a*d-b*c)^5/g^3*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+d^2/i^2/(a*d
-b*c)^5/g^3*B/(d*x+c)*b^2*c^2-d^2/i^2/(a*d-b*c)^5/g^3*A/(d*x+c)*b^2*c^2-3*d
^2/i^2/(a*d-b*c)^5/g^3*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3/2*d^2/i^2/
(a*d-b*c)^5/g^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+d^2/i^2/(a*d-b*c)
^5/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-d^3/i^2/(a*d-b*c)^5/g^3*B*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-d^4/i^2/(a*d-b*c)^5/g^3*B*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*x+c)*a^2+3/2*d^3/i^2/(a*d-b*c)^5/g^3*B*b*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2*a+3*d^3/i^2/(a*d-b*c)^5/g^3*A*b*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*a-1/2*e^2*d/i^2/(a*d-b*c)^5/g^3*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)^2*a+d^3/i^2/(a*d-b*c)^5/g^3*B*b*a-3*e*d/i^2/(a*d-b*c)^5/g^3*A*b^3/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3*e*d^2/i^2/(a*d-b*c)^5/g^3*B*b^2/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-3*e*d/i^2/(a*d-b*c)^5/g^3*B*b^3/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3*e*d^2/i^2/(a*d-b*c)^5/g^3*A*b^2/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)*a+2*d^3/i^2/(a*d-b*c)^5/g^3*A/(d*x+c)*a*b*c-2*d^3/i
^2/(a*d-b*c)^5/g^3*B/(d*x+c)*a*b*c-1/4*e^2*d/i^2/(a*d-b*c)^5/g^3*B*b^3/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-d^2/i^2/(a*d-b*c)^5/g^3*B*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2
```

Maxima [B] time = 1.85233, size = 2323, normalized size = 6.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] 1/2*B*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*
b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^
3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 -
2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d
^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*
```

```
a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*
b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2
*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3
 + a^4*d^4)*g^3*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1/2*A*((6*b^2*
d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^
5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b
^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g
^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d
^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2
- a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*
a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x + c)/
((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^
3*i^2)) - 1/4*(b^3*c^3 - 12*a*b^2*c^2*d + 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b
^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a
*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*
x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*
d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d - 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*
(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2
 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 +
 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*
c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(
b*x + a))*log(d*x + c))*B/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 +
6*a^4*b^2*c^3*d^2*g^3*i^2 - 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (
b^6*c^4*d*g^3*i^2 - 4*a*b^5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4
*a^3*b^3*c*d^4*g^3*i^2 + a^4*b^2*d^5*g^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*
b^5*c^4*d*g^3*i^2 - 2*a^2*b^4*c^3*d^2*g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 -
 7*a^4*b^2*c*d^4*g^3*i^2 + 2*a^5*b*d^5*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2
- 7*a^2*b^4*c^4*d*g^3*i^2 + 8*a^3*b^3*c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g
^3*i^2 - 2*a^5*b*c*d^4*g^3*i^2 + a^6*d^5*g^3*i^2)*x)
```

Fricas [A] time = 0.568439, size = 1368, normalized size = 3.76

$$-\frac{(2A+B)b^3c^3 - 12(A+B)ab^2c^2d + 3(2A+5B)a^2bcd^2 + 4(A-B)a^3d^3 - 6\big(\big((2A+B)b^3cd^2 - (2A+B)ab^2d^3\big)x^2 - 6\big(\cdots}{4\big(\big(b^6c^4d - 4ab^5c^3d^2 + 6a^2b^4c^2d^3 - 4\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] -1/4*((2*A + B)*b^3*c^3 - 12*(A + B)*a*b^2*c^2*d + 3*(2*A + 5*B)*a^2*b*c*d^
2 + 4*(A - B)*a^3*d^3 - 6*((2*A + B)*b^3*c*d^2 - (2*A + B)*a*b^2*d^3)*x^2 -
 6*(B*b^3*d^3*x^3 + B*a^2*b*c*d^2 + (B*b^3*c*d^2 + 2*B*a*b^2*d^3)*x^2 + (2*
B*a*b^2*c*d^2 + B*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 3*((2*A +
3*B)*b^3*c^2*d + 2*(2*A - B)*a*b^2*c*d^2 - (6*A + B)*a^2*b*d^3)*x - 2*(3*(2
*A + B)*b^3*d^3*x^3 - B*b^3*c^3 + 6*B*a*b^2*c^2*d + 6*A*a^2*b*c*d^2 - 2*B*a
^3*d^3 + 3*((2*A + 3*B)*b^3*c*d^2 + 4*A*a*b^2*d^3)*x^2 + 3*(B*b^3*c^2*d + 4
*(A + B)*a*b^2*c*d^2 + 2*(A - B)*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c))
)/((b^6*c^4*d - 4*a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a^4
*b^2*d^5)*g^3*i^2*x^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^
3*b^3*c^2*d^3 - 7*a^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*i^2*x^2 + (2*a*b^5*c^5 -
 7*a^2*b^4*c^4*d + 8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 +
a^6*d^5)*g^3*i^2*x + (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4
*a^5*b*c^2*d^3 + a^6*c*d^4)*g^3*i^2)
```

Sympy [B] time = 29.6713, size = 1562, normalized size = 4.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3/(d*i*x+c*i)**2,x)
```

```
[Out] 3*B*b*d**2*log(e*(a + b*x)/(c + d*x))**2/(2*a**4*d**4*g**3*i**2 - 8*a**3*b*
c*d**3*g**3*i**2 + 12*a**2*b**2*c**2*d**2*g**3*i**2 - 8*a*b**3*c**3*d*g**3*
i**2 + 2*b**4*c**4*g**3*i**2) - 3*b*d**2*(2*A + B)*log(x + (6*A*a*b*d**3 +
6*A*b**2*c*d**2 + 3*B*a*b*d**3 + 3*B*b**2*c*d**2 - 3*a**5*b*d**7*(2*A + B)/
(a*d - b*c)**4 + 15*a**4*b**2*c*d**6*(2*A + B)/(a*d - b*c)**4 - 30*a**3*b**
3*c**2*d**5*(2*A + B)/(a*d - b*c)**4 + 30*a**2*b**4*c**3*d**4*(2*A + B)/(a*
d - b*c)**4 - 15*a*b**5*c**4*d**3*(2*A + B)/(a*d - b*c)**4 + 3*b**6*c**5*d*
*2*(2*A + B)/(a*d - b*c)**4)/(12*A*b**2*d**3 + 6*B*b**2*d**3))/(2*g**3*i**2
*(a*d - b*c)**4) + 3*b*d**2*(2*A + B)*log(x + (6*A*a*b*d**3 + 6*A*b**2*c*d*
*2 + 3*B*a*b*d**3 + 3*B*b**2*c*d**2 + 3*a**5*b*d**7*(2*A + B)/(a*d - b*c)**
4 - 15*a**4*b**2*c*d**6*(2*A + B)/(a*d - b*c)**4 + 30*a**3*b**3*c**2*d**5*(
2*A + B)/(a*d - b*c)**4 - 30*a**2*b**4*c**3*d**4*(2*A + B)/(a*d - b*c)**4 +
 15*a*b**5*c**4*d**3*(2*A + B)/(a*d - b*c)**4 - 3*b**6*c**5*d**2*(2*A + B)/
(a*d - b*c)**4)/(12*A*b**2*d**3 + 6*B*b**2*d**3))/(2*g**3*i**2*(a*d - b*c)*
*4) + (-2*B*a**2*d**2 - 5*B*a*b*c*d - 9*B*a*b*d**2*x + B*b**2*c**2 - 3*B*b*
*2*c*d*x - 6*B*b**2*d**2*x**2)*log(e*(a + b*x)/(c + d*x))/(2*a**5*c*d**3*g*
*3*i**2 + 2*a**5*d**4*g**3*i**2*x - 6*a**4*b*c**2*d**2*g**3*i**2 - 2*a**4*b
*c*d**3*g**3*i**2*x + 4*a**4*b*d**4*g**3*i**2*x**2 + 6*a**3*b**2*c**3*d*g**
3*i**2 - 6*a**3*b**2*c**2*d**2*g**3*i**2*x - 10*a**3*b**2*c*d**3*g**3*i**2*
x**2 + 2*a**3*b**2*d**4*g**3*i**2*x**3 - 2*a**2*b**3*c**4*g**3*i**2 + 10*a*
*2*b**3*c**3*d*g**3*i**2*x + 6*a**2*b**3*c**2*d**2*g**3*i**2*x**2 - 6*a**2*
b**3*c*d**3*g**3*i**2*x**3 - 4*a*b**4*c**4*g**3*i**2*x + 2*a*b**4*c**3*d*g*
*3*i**2*x**2 + 6*a*b**4*c**2*d**2*g**3*i**2*x**3 - 2*b**5*c**4*g**3*i**2*x*
*2 - 2*b**5*c**3*d*g**3*i**2*x**3) - (4*A*a**2*d**2 + 10*A*a*b*c*d - 2*A*b*
*2*c**2 - 4*B*a**2*d**2 + 11*B*a*b*c*d - B*b**2*c**2 + x**2*(12*A*b**2*d**2
 + 6*B*b**2*d**2) + x*(18*A*a*b*d**2 + 6*A*b**2*c*d + 3*B*a*b*d**2 + 9*B*b*
*2*c*d))/(4*a**5*c*d**3*g**3*i**2 - 12*a**4*b*c**2*d**2*g**3*i**2 + 12*a**3
*b**2*c**3*d*g**3*i**2 - 4*a**2*b**3*c**4*g**3*i**2 + x**3*(4*a**3*b**2*d**
4*g**3*i**2 - 12*a**2*b**3*c*d**3*g**3*i**2 + 12*a*b**4*c**2*d**2*g**3*i**2
 - 4*b**5*c**3*d*g**3*i**2) + x**2*(8*a**4*b*d**4*g**3*i**2 - 20*a**3*b**2*
c*d**3*g**3*i**2 + 12*a**2*b**3*c**2*d**2*g**3*i**2 + 4*a*b**4*c**3*d*g**3*
i**2 - 4*b**5*c**4*g**3*i**2) + x*(4*a**5*d**4*g**3*i**2 - 4*a**4*b*c*d**3*
g**3*i**2 - 12*a**3*b**2*c**2*d**2*g**3*i**2 + 20*a**2*b**3*c**3*d*g**3*i**
2 - 8*a*b**4*c**4*g**3*i**2))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{\left(bgx+ag\right)^3(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^3*(d*i*x + c*i)
^2), x)
```

3.46 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=457

$$-\frac{6b^2d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{b^4(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4i^2(a+bx)^3(bc-ad)^5}+\frac{2b^3d(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)^2(bc-ad)^5}-\frac{4bd^3\text{lo}}{}$$

```
[Out] -((B*d^4*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x))) - (6*b^2*B*d^2*(c +
d*x))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B*d*(c + d*x)^2)/((b*c - a*d
)^5*g^4*i^2*(a + b*x)^2) - (b^4*B*(c + d*x)^3)/(9*(b*c - a*d)^5*g^4*i^2*(a
+ b*x)^3) + (2*b*B*d^3*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2)
+ (d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i
^2*(c + d*x)) - (6*b^2*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*d*(c + d*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (b^4*(c + d*x)^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3)
 - (4*b*d^3*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^5*g^4*i^2)
```

Rubi [C] time = 1.36281, antiderivative size = 705, normalized size of antiderivative = 1.54, number of steps used = 36, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{4bBd^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^4i^2(bc-ad)^5}-\frac{4bBd^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^4i^2(bc-ad)^5}-\frac{4bd^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(bc-ad)^5}-\frac{d^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{g^4i^2(c+dx)(bc}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*x)^2),
x]
```

```
[Out] -(b*B)/(9*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (2*b*B*d)/(3*(b*c - a*d)^3*g
^4*i^2*(a + b*x)^2) - (13*b*B*d^2)/(3*(b*c - a*d)^4*g^4*i^2*(a + b*x)) + (B
*d^3)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (10*b*B*d^3*Log[a + b*x])/(3*(b*c
 - a*d)^5*g^4*i^2) + (2*b*B*d^3*Log[a + b*x]^2)/((b*c - a*d)^5*g^4*i^2) - (
b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^2*g^4*i^2*(a + b*x)^
3) + (b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^4*i^2*(a +
 b*x)^2) - (3*b*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^
4*i^2*(a + b*x)) - (d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^
4*g^4*i^2*(c + d*x)) - (4*b*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c +
d*x)]))/((b*c - a*d)^5*g^4*i^2) + (10*b*B*d^3*Log[c + d*x])/(3*(b*c - a*d)^
5*g^4*i^2) - (4*b*B*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b
*c - a*d)^5*g^4*i^2) + (4*b*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x])/((b*c - a*d)^5*g^4*i^2) + (2*b*B*d^3*Log[c + d*x]^2)/((b*c - a*d)^5
*g^4*i^2) - (4*b*B*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c -
 a*d)^5*g^4*i^2) - (4*b*B*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b
*c - a*d)^5*g^4*i^2) - (4*b*B*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((
b*c - a*d)^5*g^4*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(46c+46dx)^2(ag+bgx)^4}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^2g^4(a+bx)^4} - \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1058(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^4g^4(a+b\ldots}\right.$$

$$= -\frac{\left(b^2d^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{529(bc-ad)^5g^4} + \frac{\left(bd^4\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{529(bc-ad)^5g^4} + \frac{\left(3b^2d^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{2116(bc-ad)^4g^4}\ldots$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^3g^4(a+bx)^2} - \frac{3bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^4g^4(a+bx)}\ldots$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^3g^4(a+bx)^2} - \frac{3bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^4g^4(a+bx)}\ldots$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^3g^4(a+bx)^2} - \frac{3bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc-ad)^4g^4(a+bx)}\ldots$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13bBd^2}{6348(bc-ad)^4g^4(a+bx}\ldots$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13bBd^2}{6348(bc-ad)^4g^4(a+bx}\ldots$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13bBd^2}{6348(bc-ad)^4g^4(a+bx}\ldots$$

$$= -\frac{bB}{19044(bc-ad)^2g^4(a+bx)^3} + \frac{bBd}{3174(bc-ad)^3g^4(a+bx)^2} - \frac{13bBd^2}{6348(bc-ad)^4g^4(a+bx}\ldots$$

Mathematica [C] time = 1.42348, size = 520, normalized size = 1.14

$$-\frac{-18bBd^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18bBd^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c\ldots\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*
x)^2),x]
```

```
[Out] -((b*B*(b*c - a*d)^3)/(a + b*x)^3 - (6*b*B*d*(b*c - a*d)^2)/(a + b*x)^2 + (
27*b^2*B*c*d^2)/(a + b*x) - (27*a*b*B*d^3)/(a + b*x) + (12*b*B*d^2*(b*c - a
*d))/(a + b*x) - (9*b*B*c*d^3)/(c + d*x) + (9*a*B*d^4)/(c + d*x) + 30*b*B*d
```

```
^3*Log[a + b*x] + (3*b*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(a + b*x)^3 - (9*b*d*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a
 + b*x)^2 + (27*b*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a
+ b*x) - (9*d^3*(-(b*c) + a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d
*x) + 36*b*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 30*b*B*d
^3*Log[c + d*x] - 36*b*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x
] - 18*b*B*d^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*b*B*d^3*((2*Log[(d*(
a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)]))/(9*(b*c - a*d)^5*g^4*i^2)
```

Maple [B] time = 0.055, size = 2068, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

```
[Out] -2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*e^2*d/i^2/(a*d-b*c)^6/g^4*B*b^4/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-6*e*d^2/i^
2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*c+d^4/i^2/(a*d-b*c)^6/g^4*B*b*a-d^3/i^2/(a*d-b*c)^6/g^4*B*
b^2*c-d^4/i^2/(a*d-b*c)^6/g^4*A*b*a+d^3/i^2/(a*d-b*c)^6/g^4*A*b^2*c-d^3/i^2
/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-1/3*e^3/
i^2/(a*d-b*c)^6/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*c-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A*b^3/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)^2*a+2*d^4/i^2/(a*d-b*c)^6/g^4*A/(d*x+c)*a*b*c-d^5/i^2/(
a*d-b*c)^6/g^4*A/(d*x+c)*a^2+d^5/i^2/(a*d-b*c)^6/g^4*B/(d*x+c)*a^2+6*e*d^3/
i^2/(a*d-b*c)^6/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*a+1/3*e^3*d/i^2/(a*d-b*c)^6/g^4*B*b^4/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/9*e^3*d/i^2/(a*d-b*
c)^6/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-4*d^3/i^2/(a*d-b*c)^
6/g^4*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*d^4/i^2/(a*d-b*c)^6/g^4*B*b
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-2*d^3/i^2/(a*d-b*c)^6/g^4*B*b^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^5/i^2/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*x+c)*a^2-d^4/i^2/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*b*a+d^3/i^2/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c
+4*d^4/i^2/(a*d-b*c)^6/g^4*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^3/i^2/(a
*d-b*c)^6/g^4*B/(d*x+c)*b^2*c^2-1/9*e^3/i^2/(a*d-b*c)^6/g^4*B*b^5/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/3*e^3/i^2/(a*d-b*c)^6/g^4*A*b^5/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-d^3/i^2/(a*d-b*c)^6/g^4*A/(d*x+c)*b^2*c^2+6*e
*d^3/i^2/(a*d-b*c)^6/g^4*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-2*d^4/
i^2/(a*d-b*c)^6/g^4*B/(d*x+c)*a*b*c-6*e*d^2/i^2/(a*d-b*c)^6/g^4*A*b^3/(b*e/
d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-e^2*d^2/i^2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+e^2*d/i^2/(a*d-b*c)^6/g^4*B*b^4/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^2*c+2*e^2*d/i^2/(a*d-b*c)^6/g^4*A*b^4/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/3*e^3*d/i^2/(a*d-b*c)^6/g^4*A*b^4/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^3*a+6*e*d^3/i^2/(a*d-b*c)^6/g^4*B*b^2/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)*a-6*e*d^2/i^2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e/(d*x+c
)*a-e/d/(d*x+c)*b*c)*c+2*d^4/i^2/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*x+c)*a*b*c
```

Maxima [B] time = 2.42841, size = 3456, normalized size = 7.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] -1/3*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*
d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a
^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*
c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d
^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3
*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a
^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d +
 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x
+ (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^
7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^
2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12
*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3
*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(b*e*x/(d*x + c) + a*e
/(d*x + c)) - 1/3*A*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c
*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2
*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3
 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*
a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^
4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*
c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^
3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^
5)*g^4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b
*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*
c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*
g^4*i^2) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3
*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2)) - 1/9*(b^4*c
^4 - 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3 + 9*a^4*d^4 + 30*(
b^4*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*c*d^3 - 19*a^2*b^2
*d^4)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 +
 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b
*x + a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 +
 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d
*x + c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + 57*a^2*b^2*c*d^3 + 19*a^3*b*d
^4)*x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(
a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x +
 a) - 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 +
15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*
(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3
 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*
x + c))*B/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*d
^2*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*d
^5*g^4*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3*
d^3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b^
3*d^6*g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*c
^4*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 +
14*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i^
2 - 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4
*g^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^
6*g^4*i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*
b^3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a
```

```
^8*d^6*g^4*i^2)*x)
```

Fricas [B] time = 0.612324, size = 2101, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] -1/9*((3*A + B)*b^4*c^4 - 9*(2*A + B)*a*b^3*c^3*d + 54*(A + B)*a^2*b^2*c^2*
d^2 - 5*(6*A + 11*B)*a^3*b*c*d^3 - 9*(A - B)*a^4*d^4 + 6*((6*A + 5*B)*b^4*c
*d^3 - (6*A + 5*B)*a*b^3*d^4)*x^3 + 3*((6*A + 11*B)*b^4*c^2*d^2 + 8*(3*A +
B)*a*b^3*c*d^3 - (30*A + 19*B)*a^2*b^2*d^4)*x^2 + 18*(B*b^4*d^4*x^4 + B*a^3
*b*c*d^3 + (B*b^4*c*d^3 + 3*B*a*b^3*d^4)*x^3 + 3*(B*a*b^3*c*d^3 + B*a^2*b^2
*d^4)*x^2 + (3*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x + c
))^2 - ((6*A + 5*B)*b^4*c^3*d - 27*(2*A + 3*B)*a*b^3*c^2*d^2 - 3*(6*A - 19*
B)*a^2*b^2*c*d^3 + (66*A + 19*B)*a^3*b*d^4)*x + 3*(2*(6*A + 5*B)*b^4*d^4*x^
4 + B*b^4*c^4 - 6*B*a*b^3*c^3*d + 18*B*a^2*b^2*c^2*d^2 + 12*A*a^3*b*c*d^3 -
 3*B*a^4*d^4 + 2*((6*A + 11*B)*b^4*c*d^3 + 9*(2*A + B)*a*b^3*d^4)*x^3 + 6*(
B*b^4*c^2*d^2 + 3*(2*A + 3*B)*a*b^3*c*d^3 + 6*A*a^2*b^2*d^4)*x^2 - 2*(B*b^4
*c^3*d - 9*B*a*b^3*c^2*d^2 - 18*(A + B)*a^2*b^2*c*d^3 - 6*(A - B)*a^3*b*d^4
)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b
^6*c^3*d^3 - 10*a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*i^2*x^
4 + (b^8*c^6 - 2*a*b^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*
a^4*b^4*c^2*d^4 + 14*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*g^4*i^2*x^3 + 3*(a*b^7*
c^6 - 4*a^2*b^6*c^5*d + 5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c
*d^5 - a^7*b*d^6)*g^4*i^2*x^2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*
b^4*c^4*d^2 - 20*a^5*b^3*c^3*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*
d^6)*g^4*i^2*x + (a^3*b^5*c^6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a
^6*b^2*c^3*d^3 + 5*a^7*b*c^2*d^4 - a^8*c*d^5)*g^4*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right) + A}{\left(bgx + ag\right)^4 (dix + ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^4*(d*i*x + c*i)
^2), x)
```

3.47 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=361

$$\frac{3b^2Bg^3(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}+\frac{b^2g^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right)+3A+B\right)}{d^4i^3}+\frac{g^3(a+bx)^2(bc-ad)}{2d^2}$$

```
[Out] (-3*B*(b*c - a*d)*g^3*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (3*b*B*(b*c -
a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) + (b*(3*A + B)*(b*c - a*d)*g^3*(a +
 b*x))/(d^3*i^3*(c + d*x)) + (3*b*B*(b*c - a*d)*g^3*(a + b*x)*Log[(e*(a + b
*x))/(c + d*x)])/(d^3*i^3*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(d*i^3*(c + d*x)^2) + ((b*c - a*d)*g^3*(a + b*x)^2*(3*A
+ B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) + (b^2*(b*
c - a*d)*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(3*A + B + 3*B*Log[(e*(a + b*x)
)/(c + d*x)]))/(d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*PolyLog[2, (d*(a + b*x)
)/(b*(c + d*x))])/(d^4*i^3)
```

Rubi [A] time = 0.73376, antiderivative size = 442, normalized size of antiderivative = 1.22, number of steps used = 22, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{3b^2Bg^3(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^4i^3}-\frac{3b^2g^3(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^4i^3}-\frac{3bg^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{d^4i^3(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^3,
x]
```

```
[Out] (A*b^3*g^3*x)/(d^3*i^3) - (B*(b*c - a*d)^3*g^3)/(4*d^4*i^3*(c + d*x)^2) + (
5*b*B*(b*c - a*d)^2*g^3)/(2*d^4*i^3*(c + d*x)) + (5*b^2*B*(b*c - a*d)*g^3*L
og[a + b*x])/(2*d^4*i^3) + (b^2*B*g^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)
])/(d^3*i^3) + ((b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*
d^4*i^3*(c + d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c +
 d*x)]))/(d^4*i^3*(c + d*x)) - (7*b^2*B*(b*c - a*d)*g^3*Log[c + d*x])/(2*d^
4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
 d*x])/(d^4*i^3) - (3*b^2*(b*c - a*d)*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])*Log[c + d*x])/(d^4*i^3) - (3*b^2*B*(b*c - a*d)*g^3*Log[c + d*x]^2)/(2*d
^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(
d^4*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
```

```
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(47c+47dx)^3}\,dx = \int\left(\frac{b^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{103823d^3}+\frac{(-bc+ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{103823d^3(c+dx)^3}+\frac{3b(\ldots}{\ldots}\right.$$

$$=\frac{\left(b^3g^3\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{103823d^3}-\frac{\left(3b^2(bc-ad)g^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{103823d^3}+\ldots$$

$$=\frac{Ab^3g^3x}{103823d^3}+\frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{207646d^4(c+dx)^2}-\frac{3b(bc-ad)^2g^3\left(A+B\log\ldots\right.}{103823d^4(c+dx\ldots}$$

$$=\frac{Ab^3g^3x}{103823d^3}+\frac{b^2Bg^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{103823d^3}+\frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\ldots\right.}{207646d^4(c+dx)^2}$$

$$=\frac{Ab^3g^3x}{103823d^3}+\frac{b^2Bg^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{103823d^3}+\frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\ldots\right.}{207646d^4(c+dx)^2}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc-ad)g^3\log\ldots}{207646d^4}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc-ad)g^3\log\ldots}{207646d^4}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc-ad)g^3\log\ldots}{207646d^4}$$

$$=\frac{Ab^3g^3x}{103823d^3}-\frac{B(bc-ad)^3g^3}{415292d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3}{207646d^4(c+dx)}+\frac{5b^2B(bc-ad)g^3\log\ldots}{207646d^4}$$

Mathematica [A] time = 0.466764, size = 317, normalized size = 0.88

$$\frac{g^3\left(6b^2B(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-12b^2(bc-ad)\log(c+dx)\left(B\ldots\right.\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x)^3,x]
```

```
[Out] (g^3*(4*A*b^3*d*x - (B*(b*c - a*d)^3)/(c + d*x)^2 + (10*b*B*(b*c - a*d)^2)/
(c + d*x) + 10*b^2*B*(b*c - a*d)*Log[a + b*x] + 4*b^2*B*d*(a + b*x)*Log[(e*
(a + b*x))/(c + d*x)] + (2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(c + d*x)^2 - (12*b*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(c + d*x) - 14*b^2*B*(b*c - a*d)*Log[c + d*x] - 12*b^2*(b*c - a*d)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 6*b^2*B*(b*c - a*d)*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(4*d^4*i^3)
```

Maple [B] time = 0.157, size = 1815, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x)
```

```
[Out] -1/2/d*g^3/i^3*A/(d*x+c)^2*a^3+1/4/d*g^3/i^3*B/(d*x+c)^2*a^3+5/2/d^4*g^3/i^
3*A*b^3*c-9/4/d^4*g^3/i^3*B*b^3*c-5/2/d^3*g^3/i^3*A*b^2*a+6/d^3*g^3/i^3*B*b
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*c*a+3/2/d^2*g^3/i^3*B*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+e/d^3*g^3/i^3*B*b^3*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e/d^4*g^3/i^3*B*b^4*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c-3/2/d^3*g^3/i^3*B
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2+e/d^4*g^3/i^3*B*b^4*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2-3/4
/d^2*g^3/i^3*B/(d*x+c)^2*a^2*b*c+6/d^3*g^3/i^3*A*b^2/(d*x+c)*a*c-5/d^3*g^3/
i^3*B*b^2/(d*x+c)*a*c+3/4/d^3*g^3/i^3*B/(d*x+c)^2*a*b^2*c^2+3/2/d^2*g^3/i^3
*A/(d*x+c)^2*a^2*b*c-3/d^2*g^3/i^3*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x
+c)*a^2+1/2/d^4*g^3/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3
-3/d^3*g^3/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-b*e)/b/e)*a-3/2/d^3*g^3/i^3*A/(d*x+c)^2*a*b^2*c^2+e/d^3*g^3/
i^3*A*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a+3/d^4*g^3/i^3*B*b^3*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-3/d^4*g
^3/i^3*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*c^2-e/d^4*g^3/i^3*A*b^
4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c+9/4/d^3*g^3/i^3*B*b^2*a+e/d^2*g^3/i^3*B*b
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a^
2-3/d^2*g^3/i^3*A*b/(d*x+c)*a^2+5/2/d^2*g^3/i^3*B*b/(d*x+c)*a^2-3/d^4*g^3/i
^3*A*b^3/(d*x+c)*c^2+1/2/d^4*g^3/i^3*A/(d*x+c)^2*b^3*c^3-3/d^3*g^3/i^3*B*b^
2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+3/d^4*g^3/i^3*B*b^3*d
ilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-3/d^3*g^3/i^3*A*b^2*ln(d
*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+3/d^4*g^3/i^3*A*b^3*ln(d*(b*e/d+(a*d-
b*c)*e/d/(d*x+c))-b*e)*c-1/d^3*g^3/i^3*B*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-b*e)*a+1/d^4*g^3/i^3*B*b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-5
/2/d^3*g^3/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+5/2/d^4*g^3/i^3*B*b^
3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+5/2/d^4*g^3/i^3*B*b^3/(d*x+c)*c^2-1/4/d
^4*g^3/i^3*B/(d*x+c)^2*b^3*c^3-1/2/d*g^3/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))/(d*x+c)^2*a^3-2*e/d^3*g^3/i^3*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*
e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c*a
```

Maxima [B] time = 1.81583, size = 2750, normalized size = 7.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] -3/4*B*a^2*b*g^3*(2*(2*d*x + c)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4*i
^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d
^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*
d^2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*
a*b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2
- 2*a*b*c*d^3 + a^2*d^4)*i^3)) - 1/2*A*b^3*g^3*((6*c^2*d*x + 5*c^3)/(d^6*i^
3*x^2 + 2*c*d^5*i^3*x + c^2*d^4*i^3) - 2*x/(d^3*i^3) + 6*c*log(d*x + c)/(d^
4*i^3)) + 1/4*B*a^3*g^3*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2
 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) - 2*log(b*e*x
/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b
^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x +
 c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 3/2*A*a*b^2*g^3*((4*c*d*x
+ 3*c^2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2*log(d*x + c)/(d^3*
i^3)) - 3/2*(2*d*x + c)*A*a^2*b*g^3/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*
i^3) - 1/2*A*a^3*g^3/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 1/2*(6*a^3
*b^2*d^3*g^3*log(e) - (6*g^3*log(e) + 7*g^3)*b^5*c^3 + (18*g^3*log(e) + 19*
g^3)*a*b^4*c^2*d - 2*(9*g^3*log(e) + 7*g^3)*a^2*b^3*c*d^2)*B*log(d*x + c)/(
b^2*c^2*d^4*i^3 - 2*a*b*c*d^5*i^3 + a^2*d^6*i^3) + 1/4*(4*(b^5*c^2*d^3*g^3*
log(e) - 2*a*b^4*c*d^4*g^3*log(e) + a^2*b^3*d^5*g^3*log(e))*B*x^3 + 8*(b^5*
c^3*d^2*g^3*log(e) - 2*a*b^4*c^2*d^3*g^3*log(e) + a^2*b^3*c*d^4*g^3*log(e))
*B*x^2 - 2*((4*g^3*log(e) - 5*g^3)*b^5*c^4*d - 20*(g^3*log(e) - g^3)*a*b^4*
c^3*d^2 + (28*g^3*log(e) - 27*g^3)*a^2*b^3*c^2*d^3 - 12*(g^3*log(e) - g^3)*
a^3*b^2*c*d^4)*B*x + 6*((b^5*c^3*d^2*g^3 - 3*a*b^4*c^2*d^3*g^3 + 3*a^2*b^3*
c*d^4*g^3 - a^3*b^2*d^5*g^3)*B*x^2 + 2*(b^5*c^4*d*g^3 - 3*a*b^4*c^3*d^2*g^3
 + 3*a^2*b^3*c^2*d^3*g^3 - a^3*b^2*c*d^4*g^3)*B*x + (b^5*c^5*g^3 - 3*a*b^4*
c^4*d*g^3 + 3*a^2*b^3*c^3*d^2*g^3 - a^3*b^2*c^2*d^3*g^3)*B)*log(d*x + c)^2
- ((10*g^3*log(e) - 9*g^3)*b^5*c^5 - (38*g^3*log(e) - 35*g^3)*a*b^4*c^4*d +
 (46*g^3*log(e) - 47*g^3)*a^2*b^3*c^3*d^2 - 3*(6*g^3*log(e) - 7*g^3)*a^3*b^
2*c^2*d^3)*B + 2*(2*(b^5*c^2*d^3*g^3 - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3)
*B*x^3 + (9*b^5*c^3*d^2*g^3 - 21*a*b^4*c^2*d^3*g^3 + 12*a^2*b^3*c*d^4*g^3 +
 2*a^3*b^2*d^5*g^3)*B*x^2 + 2*(3*b^5*c^4*d*g^3 - 3*a*b^4*c^3*d^2*g^3 - 6*a^
2*b^3*c^2*d^3*g^3 + 8*a^3*b^2*c*d^4*g^3)*B*x + (6*a*b^4*c^4*d*g^3 - 15*a^2*
b^3*c^3*d^2*g^3 + 11*a^3*b^2*c^2*d^3*g^3)*B)*log(b*x + a) - 2*(2*(b^5*c^2*d
^3*g^3 - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3)*B*x^3 + 4*(b^5*c^3*d^2*g^3 -
2*a*b^4*c^2*d^3*g^3 + a^2*b^3*c*d^4*g^3)*B*x^2 - 4*(b^5*c^4*d*g^3 - 5*a*b^4
*c^3*d^2*g^3 + 7*a^2*b^3*c^2*d^3*g^3 - 3*a^3*b^2*c*d^4*g^3)*B*x - (5*b^5*c^
5*g^3 - 19*a*b^4*c^4*d*g^3 + 23*a^2*b^3*c^3*d^2*g^3 - 9*a^3*b^2*c^2*d^3*g^3
)*B)*log(d*x + c))/(b^2*c^4*d^4*i^3 - 2*a*b*c^3*d^5*i^3 + a^2*c^2*d^6*i^3 +
 (b^2*c^2*d^6*i^3 - 2*a*b*c*d^7*i^3 + a^2*d^8*i^3)*x^2 + 2*(b^2*c^3*d^5*i^3
 - 2*a*b*c^2*d^6*i^3 + a^2*c*d^7*i^3)*x) - 3*(b^3*c*g^3 - a*b^2*d*g^3)*(log
(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c -
a*d)))*B/(d^4*i^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^3g^3x^3 + 3\,Aab^2g^3x^2 + 3\,Aa^2bg^3x + Aa^3g^3 + \left(Bb^3g^3x^3 + 3\,Bab^2g^3x^2 + 3\,Ba^2bg^3x + Ba^3g^3\right)\log\left(\frac{bex+ae}{dx+c}\right)}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x + c^3i^3},$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] integral((A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3 +
 (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((b*e
*x + a*e)/(d*x + c)))/(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*
i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{(dix + ci)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i)^
3, x)
```

3.48 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=251

$$-\frac{b^2Bg^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^3}-\frac{g^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2di^3(c+dx)^2}-\frac{Abg^2(a+}{d^2i^3(c+}$$

```
[Out] (B*g^2*(a + b*x)^2)/(4*d*i^3*(c + d*x)^2) - (A*b*g^2*(a + b*x))/(d^2*i^3*(c
 + d*x)) + (b*B*g^2*(a + b*x))/(d^2*i^3*(c + d*x)) - (b*B*g^2*(a + b*x)*Log
[(e*(a + b*x))/(c + d*x)])/(d^2*i^3*(c + d*x)) - (g^2*(a + b*x)^2*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(2*d*i^3*(c + d*x)^2) - (b^2*g^2*Log[(b*c - a*
d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^3) - (b^2*B*
g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rubi [A] time = 0.607139, antiderivative size = 340, normalized size of antiderivative = 1.35, number of steps used = 19, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{b^2Bg^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^3i^3}+\frac{b^2g^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^3}+\frac{2bg^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^3(c+dx)}-\frac{g^2(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^3,
x]
```

```
[Out] (B*(b*c - a*d)^2*g^2)/(4*d^3*i^3*(c + d*x)^2) - (3*b*B*(b*c - a*d)*g^2)/(2*
d^3*i^3*(c + d*x)) - (3*b^2*B*g^2*Log[a + b*x])/(2*d^3*i^3) - ((b*c - a*d)^
2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^3*i^3*(c + d*x)^2) + (2*b*
(b*c - a*d)*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^3*(c + d*x)) +
 (3*b^2*B*g^2*Log[c + d*x])/(2*d^3*i^3) - (b^2*B*g^2*Log[-((d*(a + b*x))/(b
*c - a*d))]*Log[c + d*x])/(d^3*i^3) + (b^2*g^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])*Log[c + d*x])/(d^3*i^3) + (b^2*B*g^2*Log[c + d*x]^2)/(2*d^3*i^3) -
 (b^2*B*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(48c+48dx)^3}\,dx = \int \left(\frac{(-bc+ad)^2 g^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{110592d^2(c+dx)^3} - \frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{55296d^2(c+dx)^2} \cdots\right.$$

$$= \frac{(b^2g^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{110592d^2} - \frac{(b(bc-ad)g^2)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}\,dx}{55296d^2} + \frac{((bc-ad \cdots}{}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{221184d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{55296d^3(c+dx)} + \cdots$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{221184d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{55296d^3(c+dx)} + \cdots$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{221184d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{55296d^3(c+dx)} + \cdots$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(bc-ad)^2g^2 \cdots}{2211\cdots}$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(bc-ad)^2g^2 \cdots}{2211\cdots}$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(bc-ad)^2g^2 \cdots}{2211\cdots}$$

$$= \frac{B(bc-ad)^2g^2}{442368d^3(c+dx)^2} - \frac{bB(bc-ad)g^2}{73728d^3(c+dx)} - \frac{b^2Bg^2\log(a+bx)}{73728d^3} - \frac{(bc-ad)^2g^2 \cdots}{2211\cdots}$$

Mathematica [A] time = 0.330219, size = 245, normalized size = 0.98

$$\frac{g^2\left(-2b^2B\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+4b^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A \cdots\right.\right.}{4d^3i \cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i
*x)^3,x]
```

```
[Out] (g^2*((B*(b*c - a*d)^2)/(c + d*x)^2 - (6*b*B*(b*c - a*d))/(c + d*x) - 6*b^2
*B*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c
 + d*x)^2 + (8*b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x
) + 6*b^2*B*Log[c + d*x] + 4*b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
 + d*x] - 2*b^2*B*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*d^3*i^3)
```

Maple [B] time = 0.056, size = 1569, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x)
```

```
[Out] 1/4*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*a^3-1/2*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*a^3
-1/2*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-3/d^
2*g^2/(a*d-b*c)/i^3*B*b^2/(d*x+c)*a*c-3/4/d*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*a
^2*b*c+3/4/d^2*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*a*b^2*c^2+4/d^2*g^2/(a*d-b*c)/
i^3*A*b^2/(d*x+c)*a*c-3/2/d^2*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*a*b^2*c^2-2/d^3
*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+1/2/d^
3*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+1/d
^3*g^2/(a*d-b*c)/i^3*A*b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+3/2/d*
g^2/(a*d-b*c)/i^3*B*b/(d*x+c)*a^2-2/d*g^2/(a*d-b*c)/i^3*A*b/(d*x+c)*a^2-2/d
*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/d^3*g^
2/(a*d-b*c)/i^3*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*
c)*e/d/(d*x+c))-b*e)/b/e)*c-2/d^3*g^2/(a*d-b*c)/i^3*A*b^3/(d*x+c)*c^2+1/2/d
^3*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*b^3*c^3+5/4/d^2*g^2/(a*d-b*c)/i^3*B*b^2*a-
5/4/d^3*g^2/(a*d-b*c)/i^3*B*b^3*c-3/2/d^2*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*b^2*a-1/d^2*g^2/(a*d-b*c)/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+3/2/d*g^2/(a*d
-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+4/d^2*g^2/(a*
d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c-3/2/d^2*g^2/(a
*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2+3/2/d^3*g
^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/d^2*g^2/(a*d-b*c
)/i^3*A*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a-1/d^2*g^2/(a*d-b*c)/i
^3*B*b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^3*g^2/(a*d
-b*c)/i^3*B*b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-1/4/d^3
*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*b^3*c^3+3/2/d*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*
a^2*b*c+3/2/d^3*g^2/(a*d-b*c)/i^3*B*b^3/(d*x+c)*c^2-3/2/d^2*g^2/(a*d-b*c)/i
^3*A*b^2*a+3/2/d^3*g^2/(a*d-b*c)/i^3*A*b^3*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] -1/2*B*a*b*g^2*(2*(2*d*x + c)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4*i^3
*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2
)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^
2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*
b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 -
2*a*b*c*d^3 + a^2*d^4)*i^3)) + 1/4*B*a^2*g^2*((2*b*d*x + 3*b*c - a*d)/((b*c
*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^
2)*i^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3
*x + c^2*d*i^3) + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i
^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 1/2*A
*b^2*g^2*((4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2
*log(d*x + c)/(d^3*i^3)) - 1/2*B*b^2*g^2*(((d^2*x^2 + 2*c*d*x + c^2)*log(d*
x + c)^2 + (4*c*d*x + 3*c^2)*log(d*x + c))/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c
^2*d^3*i^3) - 2*integrate(1/2*(2*d^2*x^2*log(b*x + a) + 2*d^2*x^2*log(e) +
4*c*d*x + 3*c^2)/(d^5*i^3*x^3 + 3*c*d^4*i^3*x^2 + 3*c^2*d^3*i^3*x + c^3*d^2
*i^3), x)) - (2*d*x + c)*A*a*b*g^2/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i
^3) - 1/2*A*a^2*g^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^2g^2x^2 + 2\,Aabg^2x + Aa^2g^2 + \left(Bb^2g^2x^2 + 2\,Babg^2x + Ba^2g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x + c^3i^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*
a*b*g^2*x + B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/(d^3*i^3*x^3 + 3*c*d^2
*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^2 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{(dix + ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i)^
3, x)
```

3.49 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=85

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}-\frac{Bg(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

```
[Out] -(B*g*(a + b*x)^2)/(4*(b*c - a*d)*i^3*(c + d*x)^2) + (g*(a + b*x)^2*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)*i^3*(c + d*x)^2)
```

Rubi [B] time = 0.292345, antiderivative size = 191, normalized size of antiderivative = 2.25, number of steps used = 10, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2528, 2525, 12, 44}

$$-\frac{bg\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^3(c+dx)}+\frac{g(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^2i^3(c+dx)^2}+\frac{b^2Bg\log(a+bx)}{2d^2i^3(bc-ad)}-\frac{b^2Bg\log(c+dx)}{2d^2i^3(bc-ad)}-\frac{Bg(bc-ad)}{4d^2i^3(c+dx)^2}+$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^3,x]
```

```
[Out] -(B*(b*c - a*d)*g)/(4*d^2*i^3*(c + d*x)^2) + (b*B*g)/(2*d^2*i^3*(c + d*x))
+ (b^2*B*g*Log[a + b*x])/(2*d^2*(b*c - a*d)*i^3) + ((b*c - a*d)*g*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) - (b*g*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(d^2*i^3*(c + d*x)) - (b^2*B*g*Log[c + d*x])/(2*d^2*
(b*c - a*d)*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(49c+49dx)^3}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d(c+dx)^3}+\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d(c+dx)^2}\right)dx$$

$$=\frac{(bg)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}\,dx}{117649d}-\frac{((bc-ad)g)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^3}\,dx}{117649d}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{235298d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d^2(c+dx)}+\frac{(bBg)\int \frac{bc-}{(a+bx)(}}{117649d}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{235298d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d^2(c+dx)}+\frac{(bB(bc-ad)g)}{117}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{235298d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{117649d^2(c+dx)}+\frac{(bB(bc-ad)g)}{}$$

$$=-\frac{B(bc-ad)g}{470596d^2(c+dx)^2}+\frac{bBg}{235298d^2(c+dx)}+\frac{b^2Bg\log(a+bx)}{235298d^2(bc-ad)}+\frac{(bc-ad)g}{235}$$

Mathematica [B] time = 0.151509, size = 207, normalized size = 2.44

$$\frac{g\left(-\frac{b\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2(c+dx)}+\frac{(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^2(c+dx)^2}-\frac{B\left(\frac{2b^2\log(a+bx)}{bc-ad}-\frac{2b^2\log(c+dx)}{bc-ad}+\frac{bc-ad}{(c+dx)^2}+\frac{2b}{c+dx}\right)}{4d^2}+\frac{bB\left(\frac{b\log(a+bx)}{bc-ad}-\frac{b\log(c+dx)}{bc-ad}+\frac{1}{c+dx}\right)}{d^2}\right)}{i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x
)^3,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*(c + d*x)^2)
- (b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*(c + d*x)) + (b*B*((c + d*x
)^(-1) + (b*Log[a + b*x])/(b*c - a*d) - (b*Log[c + d*x])/(b*c - a*d)))/d^2
- (B*((b*c - a*d)/(c + d*x)^2 + (2*b)/(c + d*x) + (2*b^2*Log[a + b*x])/(b*c
 - a*d) - (2*b^2*Log[c + d*x])/(b*c - a*d)))/(4*d^2)))/i^3
```

Maple [B] time = 0.05, size = 1049, normalized size = 12.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x)
```

```
[Out] 1/4/d*g/(a*d-b*c)^2/i^3*B*b^2*a-1/4/d^2*g/(a*d-b*c)^2/i^3*B*b^3*c+1/2/d^2*g
/(a*d-b*c)^2/i^3*A*b^3*c-1/2/d*g/(a*d-b*c)^2/i^3*A*b^2*a+3/2*g/(a*d-b*c)^2/
i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+1/2/d^2*g/(a*d-b*c)
^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+1/4*d*g/(a*d-b*c
```

```
)^2/i^3*B/(d*x+c)^2*a^3-1/2*d*g/(a*d-b*c)^2/i^3*A/(d*x+c)^2*a^3-g/(a*d-b*c)
^2/i^3*A*b/(d*x+c)*a^2+1/2*g/(a*d-b*c)^2/i^3*B*b/(d*x+c)*a^2-g/(a*d-b*c)^2/
i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/2/d^2*g/(a*d-b*c)^2/i
^3*B*b^3/(d*x+c)*c^2-1/2/d*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*b^2*a-1/4/d^2*g/(a*d-b*c)^2/i^3*B/(d*x+c)^2*b^3*c^3+3/2*g/(a*d-b*c)^2/i
^3*A/(d*x+c)^2*a^2*b*c+1/2/d^2*g/(a*d-b*c)^2/i^3*A/(d*x+c)^2*b^3*c^3+1/2/d^
2*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/2*d*g/(a*d-b*
c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-1/d^2*g/(a*d-b*c)^
2/i^3*A*b^3/(d*x+c)*c^2-3/4*g/(a*d-b*c)^2/i^3*B/(d*x+c)^2*a^2*b*c-1/d^2*g/(
a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/d*g/(a*d
-b*c)^2/i^3*B*b^2/(d*x+c)*a*c+3/4/d*g/(a*d-b*c)^2/i^3*B/(d*x+c)^2*a*b^2*c^2
+2/d*g/(a*d-b*c)^2/i^3*A*b^2/(d*x+c)*a*c-3/2/d*g/(a*d-b*c)^2/i^3*A/(d*x+c)^
2*a*b^2*c^2+2/d*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*
x+c)*a*c-3/2/d*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^
2*a*b^2*c^2
```

Maxima [B] time = 1.25232, size = 765, normalized size = 9.

$$-\frac{1}{4}\,Bbg\left(\frac{2\,(2\,dx+c)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{d^4i^3x^2+2\,cd^3i^3x+c^2d^2i^3}-\frac{bc^2-3\,acd+2\left(bcd-2\,ad^2\right)x}{\left(bcd^4-ad^5\right)i^3x^2+2\left(bc^2d^3-acd^4\right)i^3x+\left(bc^3d^2-ac^2d^3\right)i^3}-\frac{2\left(b^2c-2\,abd\right)\log}{\left(b^2c^2d^2-2\,abcd^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorit
hm="maxima")
```

```
[Out] -1/4*B*b*g*(2*(2*d*x + c)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4*i^3*x^2
 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)
/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 -
a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*
d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*
b*c*d^3 + a^2*d^4)*i^3)) + 1/4*B*a*g*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a
*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3)
- 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2
*d*i^3) + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*
b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*(2*d*x +
c)*A*b*g/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*A*a*g/(d^3*i^3*x
^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
```

Fricas [B] time = 0.476337, size = 366, normalized size = 4.31

$$-\frac{2\left((2\,A-B)b^2cd-(2\,A-B)abd^2\right)gx+\left((2\,A-B)b^2c^2-(2\,A-B)a^2d^2\right)g-2\left(Bb^2d^2gx^2+2\,Babd^2gx+Ba^2d^2g\right)\log\left(\frac{bex}{dx}\right.}{4\left(\left(bcd^4-ad^5\right)i^3x^2+2\left(bc^2d^3-acd^4\right)i^3x+\left(bc^3d^2-ac^2d^3\right)i^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorit
hm="fricas")
```

```
[Out] -1/4*(2*((2*A - B)*b^2*c*d - (2*A - B)*a*b*d^2)*g*x + ((2*A - B)*b^2*c^2 -
(2*A - B)*a^2*d^2)*g - 2*(B*b^2*d^2*g*x^2 + 2*B*a*b*d^2*g*x + B*a^2*d^2*g)*
log((b*e*x + a*e)/(d*x + c)))/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a
```

```
*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)
```

Sympy [B] time = 6.02962, size = 382, normalized size = 4.49

$$\frac{Bb^2g\log\left(x+\frac{-\frac{Ba^2b^2d^2g}{ad-bc}+\frac{2Bab^3cdg}{ad-bc}+Bab^2dg-\frac{Bb^4c^2g}{ad-bc}+Bb^3cg}{2Bb^3dg}\right)}{2d^2i^3(ad-bc)}-\frac{Bb^2g\log\left(x+\frac{\frac{Ba^2b^2d^2g}{ad-bc}-\frac{2Bab^3cdg}{ad-bc}+Bab^2dg+\frac{Bb^4c^2g}{ad-bc}+Bb^3cg}{2Bb^3dg}\right)}{2d^2i^3(ad-bc)}-\frac{2Aadg+2A\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] B*b**2*g*log(x + (-B*a**2*b**2*d**2*g/(a*d - b*c) + 2*B*a*b**3*c*d*g/(a*d -
 b*c) + B*a*b**2*d*g - B*b**4*c**2*g/(a*d - b*c) + B*b**3*c*g)/(2*B*b**3*d*
g))/(2*d**2*i**3*(a*d - b*c)) - B*b**2*g*log(x + (B*a**2*b**2*d**2*g/(a*d -
 b*c) - 2*B*a*b**3*c*d*g/(a*d - b*c) + B*a*b**2*d*g + B*b**4*c**2*g/(a*d -
b*c) + B*b**3*c*g)/(2*B*b**3*d*g))/(2*d**2*i**3*(a*d - b*c)) - (2*A*a*d*g +
 2*A*b*c*g - B*a*d*g - B*b*c*g + x*(4*A*b*d*g - 2*B*b*d*g))/(4*c**2*d**2*i*
*3 + 8*c*d**3*i**3*x + 4*d**4*i**3*x**2) + (-B*a*d*g - B*b*c*g - 2*B*b*d*g*
x)*log(e*(a + b*x)/(c + d*x))/(2*c**2*d**2*i**3 + 4*c*d**3*i**3*x + 2*d**4*
i**3*x**2)
```

Giac [B] time = 1.38173, size = 258, normalized size = 3.04

$$-\frac{Bb^2g\log(bx+a)}{2\left(bcd^2i-ad^3i\right)}+\frac{Bb^2g\log(dx+c)}{2\left(bcd^2i-ad^3i\right)}-\frac{\left(2\,Bbdgix+Bbcgi+Badgi\right)\log\left(\frac{bx+a}{dx+c}\right)}{2\left(d^4x^2+2\,cd^3x+c^2d^2\right)}-\frac{4\,Abdgix+2\,Bbdgix+2\,Abcgi+\cdots}{4\left(d^4x^2+2\,cd^3x\cdots\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorit
hm="giac")
```

```
[Out] -1/2*B*b^2*g*log(b*x + a)/(b*c*d^2*i - a*d^3*i) + 1/2*B*b^2*g*log(d*x + c)/
(b*c*d^2*i - a*d^3*i) - 1/2*(2*B*b*d*g*i*x + B*b*c*g*i + B*a*d*g*i)*log((b*
x + a)/(d*x + c))/(d^4*x^2 + 2*c*d^3*x + c^2*d^2) - 1/4*(4*A*b*d*g*i*x + 2*
B*b*d*g*i*x + 2*A*b*c*g*i + B*b*c*g*i + 2*A*a*d*g*i + B*a*d*g*i)/(d^4*x^2 +
 2*c*d^3*x + c^2*d^2)
```

3.50 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=144

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2di^3(c+dx)^2}+\frac{b^2B\log(a+bx)}{2di^3(bc-ad)^2}-\frac{b^2B\log(c+dx)}{2di^3(bc-ad)^2}+\frac{bB}{2di^3(c+dx)(bc-ad)}+\frac{B}{4di^3(c+dx)^2}$$

```
[Out] B/(4*d*i^3*(c + d*x)^2) + (b*B)/(2*d*(b*c - a*d)*i^3*(c + d*x)) + (b^2*B*Lo
g[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/
(2*d*i^3*(c + d*x)^2) - (b^2*B*Log[c + d*x])/(2*d*(b*c - a*d)^2*i^3)
```

Rubi [A] time = 0.0993907, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2di^3(c+dx)^2}+\frac{b^2B\log(a+bx)}{2di^3(bc-ad)^2}-\frac{b^2B\log(c+dx)}{2di^3(bc-ad)^2}+\frac{bB}{2di^3(c+dx)(bc-ad)}+\frac{B}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^3,x]
```

```
[Out] B/(4*d*i^3*(c + d*x)^2) + (b*B)/(2*d*(b*c - a*d)*i^3*(c + d*x)) + (b^2*B*Lo
g[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/
(2*d*i^3*(c + d*x)^2) - (b^2*B*Log[c + d*x])/(2*d*(b*c - a*d)^2*i^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(50c+50dx)^3}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c+dx)^2} + \frac{B\int \frac{bc-ad}{2500(a+bx)(c+dx)^3}\,dx}{100d}$$
$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c+dx)^2} + \frac{(B(bc-ad))\int \frac{1}{(a+bx)(c+dx)^3}\,dx}{250000d}$$
$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c+dx)^2} + \frac{(B(bc-ad))\int \left(\frac{b^3}{(bc-ad)^3(a+bx)} - \frac{d}{(bc-ad)(c+dx)^3} - \frac{bd}{(bc-ad)^2(c+dx)^2} - \frac{b}{(bc-ad}\right.}{250000d}$$
$$= \frac{B}{500000d(c+dx)^2} + \frac{bB}{250000d(bc-ad)(c+dx)} + \frac{b^2B\log(a+bx)}{250000d(bc-ad)^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c+dx)^2}$$

Mathematica [A] time = 0.11675, size = 111, normalized size = 0.77

$$\frac{\frac{B\left(2b^2(c+dx)^2\log(a+bx)+(bc-ad)(-ad+3bc+2bdx)-2b^2(c+dx)^2\log(c+dx)\right)}{(bc-ad)^2} - 2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*((b*c - a*d)*(3*b*c - a*d + 2
*b*d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]))
/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

Maple [B] time = 0.052, size = 746, normalized size = 5.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x)
```

```
[Out] 1/2/(a*d-b*c)^3/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-1/2/d/(a*d-b*c)
^3/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/2*d/(a*d-b*c)^3/i^3*B*b/(d
*x+c)*a^2+1/2/d/(a*d-b*c)^3/i^3*A/(d*x+c)^2*b^3*c^3-1/2*d^2/(a*d-b*c)^3/i^3
*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-1/4/d/(a*d-b*c)^3/i^3*B/(d
*x+c)^2*b^3*c^3-1/2/d/(a*d-b*c)^3/i^3*B*b^3/(d*x+c)*c^2-3/2/(a*d-b*c)^3/i^3
*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^2*c^2*a+3/2*d/(a*d-b*c)^3/i^
3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+1/2/(a*d-b*c)^3/i^3*A
*b^2*a+1/(a*d-b*c)^3/i^3*B*b^2/(d*x+c)*c*a-3/2/(a*d-b*c)^3/i^3*A/(d*x+c)^2*
a*b^2*c^2+1/2/d/(a*d-b*c)^3/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2
*b^3*c^3-3/4*d/(a*d-b*c)^3/i^3*B/(d*x+c)^2*a^2*b*c+3/2*d/(a*d-b*c)^3/i^3*A/
(d*x+c)^2*a^2*b*c+3/4/(a*d-b*c)^3/i^3*B/(d*x+c)^2*b^2*c^2*a-1/2/d/(a*d-b*c)
^3/i^3*A*b^3*c+1/4*d^2/(a*d-b*c)^3/i^3*B/(d*x+c)^2*a^3-1/2*d^2/(a*d-b*c)^3/
i^3*A/(d*x+c)^2*a^3-3/4/(a*d-b*c)^3/i^3*B*b^2*a+3/4/d/(a*d-b*c)^3/i^3*B*b^3
*c
```

Maxima [A] time = 1.19764, size = 344, normalized size = 2.39

$$\frac{1}{4}B\left(\frac{2\,bdx+3\,bc-ad}{\left(bcd^3-ad^4\right)i^3x^2+2\left(bc^2d^2-acd^3\right)i^3x+\left(bc^3d-ac^2d^2\right)i^3} - \frac{2\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{d^3i^3x^2+2\,cd^2i^3x+c^2di^3} + \frac{2\,b^2\log(bx+a)}{\left(b^2c^2d-2\,abcd^2+a^2d^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorithm="maxima")
```

```
[Out] 1/4*B*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 -
a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) - 2*log(b*e*x/(d*x + c) + a*e/(
d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b^2*log(b*x + a)/((
b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d -
2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*A/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i
^3)
```

Fricas [A] time = 0.486076, size = 455, normalized size = 3.16

$$-\frac{(2A-3B)b^2c^2-4(A-B)abcd+(2A-B)a^2d^2-2\left(Bb^2cd-Babd^2\right)x-2\left(Bb^2d^2x^2+2Bb^2cdx+2Babcd-Ba^2d^2\right)\log}{4\left(\left(b^2c^2d^3-2abcd^4+a^2d^5\right)i^3x^2+2\left(b^2c^3d^2-2abc^2d^3+a^2cd^4\right)i^3x+\left(b^2c^4d-2abc^3d^2+a^2c^2d^3\right)i^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorithm="fricas")
```

```
[Out] -1/4*((2*A - 3*B)*b^2*c^2 - 4*(A - B)*a*b*c*d + (2*A - B)*a^2*d^2 - 2*(B*b^
2*c*d - B*a*b*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*b^2*c*d*x + 2*B*a*b*c*d - B*a
^2*d^2)*log((b*e*x + a*e)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5
)*i^3*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*i^3*x + (b^2*c^4*d
- 2*a*b*c^3*d^2 + a^2*c^2*d^3)*i^3)
```

Sympy [B] time = 2.99029, size = 422, normalized size = 2.93

$$-\frac{Bb^2\log\left(x+\frac{-\frac{Ba^3b^2d^3}{(ad-bc)^2}+\frac{3Ba^2b^3cd^2}{(ad-bc)^2}-\frac{3Bab^4c^2d}{(ad-bc)^2}+Bab^2d+\frac{Bb^5c^3}{(ad-bc)^2}+Bb^3c}{2Bb^3d}\right)}{2di^3(ad-bc)^2}+\frac{Bb^2\log\left(x+\frac{\frac{Ba^3b^2d^3}{(ad-bc)^2}-\frac{3Ba^2b^3cd^2}{(ad-bc)^2}+\frac{3Bab^4c^2d}{(ad-bc)^2}+Bab^2d-\frac{Bb^5c^3}{(ad-bc)^2}+Bb^3c}{2Bb^3d}\right)}{2di^3(ad-bc)^2}-\frac{}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

```
[Out] -B*b**2*log(x + (-B*a**3*b**2*d**3/(a*d - b*c)**2 + 3*B*a**2*b**3*c*d**2/(a
*d - b*c)**2 - 3*B*a*b**4*c**2*d/(a*d - b*c)**2 + B*a*b**2*d + B*b**5*c**3/
(a*d - b*c)**2 + B*b**3*c)/(2*B*b**3*d))/(2*d*i**3*(a*d - b*c)**2) + B*b**2
*log(x + (B*a**3*b**2*d**3/(a*d - b*c)**2 - 3*B*a**2*b**3*c*d**2/(a*d - b*c
)**2 + 3*B*a*b**4*c**2*d/(a*d - b*c)**2 + B*a*b**2*d - B*b**5*c**3/(a*d - b
*c)**2 + B*b**3*c)/(2*B*b**3*d))/(2*d*i**3*(a*d - b*c)**2) - B*log(e*(a + b
*x)/(c + d*x))/(2*c**2*d*i**3 + 4*c*d**2*i**3*x + 2*d**3*i**3*x**2) - (2*A*
a*d - 2*A*b*c - B*a*d + 3*B*b*c + 2*B*b*d*x)/(4*a*c**2*d**2*i**3 - 4*b*c**3
*d*i**3 + x**2*(4*a*d**4*i**3 - 4*b*c*d**3*i**3) + x*(8*a*c*d**3*i**3 - 8*b
*c**2*d**2*i**3))
```

Giac [A] time = 1.31786, size = 282, normalized size = 1.96

$$-\frac{Bb^2\log(bx+a)}{2\left(b^2c^2di-2abcd^2i+a^2d^3i\right)}+\frac{Bb^2\log(dx+c)}{2\left(b^2c^2di-2abcd^2i+a^2d^3i\right)}-\frac{Bi\log\left(\frac{bx+a}{dx+c}\right)}{2\left(d^3x^2+2cd^2x+c^2d\right)}+\frac{2Bbdix-2Abci+Bb}{4\left(bcd^3x^2-ad^4x^2+2bc^2d^2x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] -1/2*B*b^2*log(b*x + a)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) + 1/2*B*b
^2*log(d*x + c)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) - 1/2*B*i*log((b*
x + a)/(d*x + c))/(d^3*x^2 + 2*c*d^2*x + c^2*d) + 1/4*(2*B*b*d*i*x - 2*A*b*
c*i + B*b*c*i + 2*A*a*d*i + B*a*d*i)/(b*c*d^3*x^2 - a*d^4*x^2 + 2*b*c^2*d^2
*x - 2*a*c*d^3*x + b*c^3*d - a*c^2*d^2)
```

3.51 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=243

$$\frac{b^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi^3(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi^3(c+dx)(bc-ad)^3}-\frac{b^2B\log^2\left(\frac{a}{c}\right.}{2gi^3(bc-a}$$

```
[Out] -(B*(4*b - (d*(a + b*x))/(c + d*x))^2)/(4*(b*c - a*d)^3*g*i^3) - (b^2*B*Log
[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^3*g*i^3) + (d^2*(a + b*x)^2*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) - (2*b*d
*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g*i^3*(c +
d*x)) + (b^2*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/((b*c - a*d)^3*g*i^3)
```

Rubi [C] time = 0.89849, antiderivative size = 535, normalized size of antiderivative = 2.2, number of steps used = 28, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44}

$$\frac{b^2B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{gi^3(bc-ad)^3}+\frac{b^2B\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{gi^3(bc-ad)^3}+\frac{b^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{gi^3(bc-ad)^3}-\frac{b^2\log(c+dx)\left(B\log\left(\frac{e(a+}{c+}\right.\right.}{gi^3(bc-ad)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)^3),x]
```

```
[Out] -B/(4*(b*c - a*d)*g*i^3*(c + d*x)^2) - (3*b*B)/(2*(b*c - a*d)^2*g*i^3*(c +
d*x)) - (3*b^2*B*Log[a + b*x])/(2*(b*c - a*d)^3*g*i^3) - (b^2*B*Log[a + b*x
]^2)/(2*(b*c - a*d)^3*g*i^3) + (A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*(b*c
 - a*d)*g*i^3*(c + d*x)^2) + (b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c
 - a*d)^2*g*i^3*(c + d*x)) + (b^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/((b*c - a*d)^3*g*i^3) + (3*b^2*B*Log[c + d*x])/(2*(b*c - a*d)^3*g
*i^3) + (b^2*B*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)
^3*g*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c -
 a*d)^3*g*i^3) - (b^2*B*Log[c + d*x]^2)/(2*(b*c - a*d)^3*g*i^3) + (b^2*B*Lo
g[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (b^2*B*P
olyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (b^2*B*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(51c+51dx)^3(ag+bgx)}\,dx = \int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^3g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)g(c+dx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^2g(c+d\ldots}\right.$$

$$= \frac{b^3\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{132651(bc-ad)^3g} - \frac{(b^2d)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{132651(bc-ad)^3g} - \frac{(bd)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}dx}{132651(bc-ad)^2g} - \frac{d\int\frac{A+B\ldots}{}}{13265\ldots}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+B\log\left(\ldots\right.\right.}{132651(bc-ad)^3g}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+B\log\left(\ldots\right.\right.}{132651(bc-ad)^3g}$$

$$= \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{132651(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+B\log\left(\ldots\right.\right.}{132651(bc-ad)^3g}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+bx)}{88434(bc-ad)^3g} + \frac{A\ldots}{26530\ldots}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+bx)}{88434(bc-ad)^3g} + \frac{A\ldots}{26530\ldots}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+bx)}{88434(bc-ad)^3g} - \frac{b^2B\,\mathrm{lo}\ldots}{26530\ldots}$$

$$= -\frac{B}{530604(bc-ad)g(c+dx)^2} - \frac{bB}{88434(bc-ad)^2g(c+dx)} - \frac{b^2B\log(a+bx)}{88434(bc-ad)^3g} - \frac{b^2B\,\mathrm{lo}\ldots}{26530\ldots}$$

Mathematica [C] time = 0.46679, size = 418, normalized size = 1.72

$$\frac{-2b^2B(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2B(c+dx)^2\left(2\mathrm{PolyLog}\left(2,\frac{b(c+\ldots}{bc-\ldots}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)*(c*i + d*i*x)
^3),x]
```

```
[Out] (2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b*(b*c - a*d)*(c
+ d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b^2*(c + d*x)^2*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[c + d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x
)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c -
a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c +
 d*x]) - 2*b^2*B*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*(
c + d*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*
x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^3*g*i^3*(c +
d*x)^2)
```

Maple [B] time = 0.054, size = 1287, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] -3/2/i^3/(a*d-b*c)^4/g*A*b^3*c-3/2*d^2/i^3/(a*d-b*c)^4/g*B*b/(d*x+c)*a^2+3/
2*d/i^3/(a*d-b*c)^4/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-1/2*d/i^3/(a*
d-b*c)^4/g*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/2/i^3/(a*d-b*c)^4/g*
B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3-1/2*d^3/i^3/(a*d-b*c)^4
/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-d/i^3/(a*d-b*c)^4/g*A*b^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-7/4*d/i^3/(a*d-b*c)^4/g*B*b^2*a+7/4/i^3
/(a*d-b*c)^4/g*B*b^3*c-3/2*d/i^3/(a*d-b*c)^4/g*A/(d*x+c)^2*a*b^2*c^2+3/2*d/
i^3/(a*d-b*c)^4/g*A*b^2*a+1/i^3/(a*d-b*c)^4/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))*b^3/(d*x+c)*c^2+d^2/i^3/(a*d-b*c)^4/g*A*b/(d*x+c)*a^2-3/2/i^3/(a*d-b*c
)^4/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c+1/2/i^3/(a*d-b*c)^4/g*B*b^3*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/2*d^3/i^3/(a*d-b*c)^4/g*A/(d*x+c)^2*a^
3+1/i^3/(a*d-b*c)^4/g*A*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2/i^3/(a*d-
b*c)^4/g*A/(d*x+c)^2*b^3*c^3+1/i^3/(a*d-b*c)^4/g*A*b^3/(d*x+c)*c^2+1/4*d^3/
i^3/(a*d-b*c)^4/g*B/(d*x+c)^2*a^3-1/4/i^3/(a*d-b*c)^4/g*B/(d*x+c)^2*b^3*c^3
-3/2/i^3/(a*d-b*c)^4/g*B*b^3/(d*x+c)*c^2+3/2*d^2/i^3/(a*d-b*c)^4/g*B*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d/i^3/(a*d-b*c)^4/g*B*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-2*d/i^3/(a*d-b*c)^4/g*B*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c+d^2/i^3/(a*d-b*c)^4/g*B*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-2*d/i^3/(a*d-b*c)^4/g*A*b^2/(d*x+c)*
a*c+3/4*d/i^3/(a*d-b*c)^4/g*B/(d*x+c)^2*a*b^2*c^2-3/4*d^2/i^3/(a*d-b*c)^4/g
*B/(d*x+c)^2*a^2*b*c+3/2*d^2/i^3/(a*d-b*c)^4/g*A/(d*x+c)^2*a^2*b*c+3*d/i^3/
(a*d-b*c)^4/g*B*b^2/(d*x+c)*a*c
```

Maxima [B] time = 1.42318, size = 1195, normalized size = 4.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algorit
hm="maxima")
```

```
[Out] 1/2*B*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i^3
*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a*b
*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d
 + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x +
c)) + 1/2*A*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)
*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 -
 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 - 3
*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3)) - 1/4*(7*b^2*c^2 - 8*a*b*c*
d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b
^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*
x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2
 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*
x + a))*log(d*x + c))*B/(b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*
d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3
+ 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c
^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x)
```

Fricas [A] time = 0.534056, size = 730, normalized size = 3.

$$\frac{(6A-7B)b^2c^2-8(A-B)abcd+(2A-B)a^2d^2+2\left(Bb^2d^2x^2+2Bb^2cdx+Bb^2c^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\left((2A-3B)b^2cd-(\right.}{4\left(\left(b^3c^3d^2-3ab^2c^2d^3+3a^2bcd^4-a^3d^5\right)gi^3x^2+2\left(b^3c^4d-3ab^2c^3d^2+3\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algorit
hm="fricas")
```

```
[Out] 1/4*((6*A - 7*B)*b^2*c^2 - 8*(A - B)*a*b*c*d + (2*A - B)*a^2*d^2 + 2*(B*b^2
*d^2*x^2 + 2*B*b^2*c*d*x + B*b^2*c^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*((
2*A - 3*B)*b^2*c*d - (2*A - 3*B)*a*b*d^2)*x + 2*((2*A - 3*B)*b^2*d^2*x^2 +
2*A*b^2*c^2 - 4*B*a*b*c*d + B*a^2*d^2 + 2*(2*(A - B)*b^2*c*d - B*a*b*d^2)*x
)*log((b*e*x + a*e)/(d*x + c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c
*d^4 - a^3*d^5)*g*i^3*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^
3 - a^3*c*d^4)*g*i^3*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c
^2*d^3)*g*i^3)
```

Sympy [B] time = 8.0485, size = 889, normalized size = 3.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] -B*b**2*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d**3*g*i**3 - 6*a**2*b*c*d**2
*g*i**3 + 6*a*b**2*c**2*d*g*i**3 - 2*b**3*c**3*g*i**3) + b**2*(2*A - 3*B)*l
og(x + (2*A*a*b**2*d + 2*A*b**3*c - 3*B*a*b**2*d - 3*B*b**3*c - a**4*b**2*d
**4*(2*A - 3*B)/(a*d - b*c)**3 + 4*a**3*b**3*c*d**3*(2*A - 3*B)/(a*d - b*c)
**3 - 6*a**2*b**4*c**2*d**2*(2*A - 3*B)/(a*d - b*c)**3 + 4*a*b**5*c**3*d*(2
*A - 3*B)/(a*d - b*c)**3 - b**6*c**4*(2*A - 3*B)/(a*d - b*c)**3)/(4*A*b**3*
d - 6*B*b**3*d))/(2*g*i**3*(a*d - b*c)**3) - b**2*(2*A - 3*B)*log(x + (2*A*
a*b**2*d + 2*A*b**3*c - 3*B*a*b**2*d - 3*B*b**3*c + a**4*b**2*d**4*(2*A - 3
*B)/(a*d - b*c)**3 - 4*a**3*b**3*c*d**3*(2*A - 3*B)/(a*d - b*c)**3 + 6*a**2
*b**4*c**2*d**2*(2*A - 3*B)/(a*d - b*c)**3 - 4*a*b**5*c**3*d*(2*A - 3*B)/(a
*d - b*c)**3 + b**6*c**4*(2*A - 3*B)/(a*d - b*c)**3)/(4*A*b**3*d - 6*B*b**3
*d))/(2*g*i**3*(a*d - b*c)**3) + (-B*a*d + 3*B*b*c + 2*B*b*d*x)*log(e*(a +
b*x)/(c + d*x))/(2*a**2*c**2*d**2*g*i**3 + 4*a**2*c*d**3*g*i**3*x + 2*a**2*
d**4*g*i**3*x**2 - 4*a*b*c**3*d*g*i**3 - 8*a*b*c**2*d**2*g*i**3*x - 4*a*b*c
*d**3*g*i**3*x**2 + 2*b**2*c**4*g*i**3 + 4*b**2*c**3*d*g*i**3*x + 2*b**2*c*
*2*d**2*g*i**3*x**2) + (-2*A*a*d + 6*A*b*c + B*a*d - 7*B*b*c + x*(4*A*b*d -
 6*B*b*d))/(4*a**2*c**2*d**2*g*i**3 - 8*a*b*c**3*d*g*i**3 + 4*b**2*c**4*g*i
**3 + x**2*(4*a**2*d**4*g*i**3 - 8*a*b*c*d**3*g*i**3 + 4*b**2*c**2*d**2*g*i
**3) + x*(8*a**2*c*d**3*g*i**3 - 16*a*b*c**2*d**2*g*i**3 + 8*b**2*c**3*d*g*
i**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{\left(bgx+ag\right)(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)*(d*i*x + c*i)^3
), x)
```

3.52 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=365

$$-\frac{b^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{3b^2d\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(bc-ad)^4}+\frac{3bd^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(c+dx)(bc-ad)^4}-\frac{d^3(a+\cdots}{2g^2\cdots}$$

```
[Out] (B*d^3*(a + b*x)^2)/(4*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (3*b*B*d^2*(a +
 b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*B*(c + d*x))/((b*c - a*d)^4
*g^2*i^3*(a + b*x)) + (3*b^2*B*d*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)
^4*g^2*i^3) - (d^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*
c - a*d)^4*g^2*i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*(c + d*x)*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(a + b*x)) - (3*b^2*d*
Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)
^4*g^2*i^3)
```

Rubi [C] time = 1.11099, antiderivative size = 631, normalized size of antiderivative = 1.73, number of steps used = 32, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{3b^2Bd\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4}-\frac{3b^2Bd\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4}-\frac{3b^2d\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(bc-ad)^4}-\frac{b^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\cdots\right.}{g^2i^3(a+bx)(bc-\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*x)^3),
x]
```

```
[Out] -((b^2*B)/((b*c - a*d)^3*g^2*i^3*(a + b*x))) + (B*d)/(4*(b*c - a*d)^2*g^2*i
^3*(c + d*x)^2) + (5*b*B*d)/(2*(b*c - a*d)^3*g^2*i^3*(c + d*x)) + (3*b^2*B*
d*Log[a + b*x])/(2*(b*c - a*d)^4*g^2*i^3) + (3*b^2*B*d*Log[a + b*x]^2)/(2*(
b*c - a*d)^4*g^2*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c -
a*d)^3*g^2*i^3*(a + b*x)) - (d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*
c - a*d)^2*g^2*i^3*(c + d*x)^2) - (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/((b*c - a*d)^3*g^2*i^3*(c + d*x)) - (3*b^2*d*Log[a + b*x]*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*Log[c + d*x])
/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*L
og[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B*d*Log[c + d*x]^2
)/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*Log[a + b*x]*Log[(b*(c + d*x))/(b*
c - a*d)])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*PolyLog[2, -((d*(a + b*x))/
(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*PolyLog[2, (b*(c + d*x)
)/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(52c+52dx)^3(ag+bgx)^2}\,dx = \int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)^2} - \frac{3b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^4g^2(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(}{c}\right.\right.}{140608(bc-ad)^2g^2}\right.$$

$$= -\frac{(3b^3d)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx}{140608(bc-ad)^4g^2} + \frac{(3b^2d^2)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{140608(bc-ad)^4g^2} + \frac{b^3\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}dx}{140608(bc-ad)^3g^2} +$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc-ad)^2g^2(c+dx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{70304(bc-ad)^3g^2(c+}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc-ad)^2g^2(c+dx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{70304(bc-ad)^3g^2(c+}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc-ad)^2g^2(c+dx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{70304(bc-ad)^3g^2(c+}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{5bBd}{281216(bc-ad)^3g^2(c}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{5bBd}{281216(bc-ad)^3g^2(c}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{5bBd}{281216(bc-ad)^3g^2(c}$$

$$= -\frac{b^2B}{140608(bc-ad)^3g^2(a+bx)} + \frac{Bd}{562432(bc-ad)^2g^2(c+dx)^2} + \frac{5bBd}{281216(bc-ad)^3g^2(c}$$

Mathematica [C] time = 0.787865, size = 452, normalized size = 1.24

$$6b^2Bd\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-6b^2Bd\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^2*(c*i + d*i*
x)^3),x]
```

```
[Out] ((-4*b^3*B*c)/(a + b*x) + (4*a*b^2*B*d)/(a + b*x) + (B*d*(b*c - a*d)^2)/(c
+ d*x)^2 + (8*b^2*B*c*d)/(c + d*x) - (8*a*b*B*d^2)/(c + d*x) + (2*b*B*d*(b*
c - a*d))/(c + d*x) + 6*b^2*B*d*Log[a + b*x] - (4*b^2*(b*c - a*d)*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(a + b*x) - (2*d*(b*c - a*d)^2*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(c + d*x)^2 - (8*b*d*(b*c - a*d)*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(c + d*x) - 12*b^2*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]) - 6*b^2*B*d*Log[c + d*x] + 12*b^2*d*(A + B*Log[(e*(a + b*x))
/(c + d*x)])*Log[c + d*x] + 6*b^2*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(
```

```
b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) -
6*b^2*B*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^4*g^2*i^3)
```

Maple [B] time = 0.053, size = 1729, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] -5/2*d/i^3/(a*d-b*c)^5/g^2*A*b^3*c+11/4*d/i^3/(a*d-b*c)^5/g^2*B*b^3*c+5/2*d
^2/i^3/(a*d-b*c)^5/g^2*A*b^2*a-11/4*d^2/i^3/(a*d-b*c)^5/g^2*B*b^2*a-4*d^2/i
^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c-e*d/i^
3/(a*d-b*c)^5/g^2*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*a+3/2*d^3/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*x+c)^2*a^2*b*c-3/2*d^2/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-3/2*d^2/i^3/(a*d-b*c)^5/g^2*A/(d*x+c)^2*b^2*
c^2*a-3/4*d^3/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*a^2*b*c+3/2*d^3/i^3/(a*d-b*c)
^5/g^2*A/(d*x+c)^2*a^2*b*c+3/4*d^2/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*a*b^2*c^
2+5*d^2/i^3/(a*d-b*c)^5/g^2*B*b^2/(d*x+c)*a*c+e/i^3/(a*d-b*c)^5/g^2*B*b^4/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-e*d/i^
3/(a*d-b*c)^5/g^2*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d/i^3/(a*d-
b*c)^5/g^2*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*d^3/i^3/(a*d-b*c)^
5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+2*d/i^3/(a*d-b*c)^5/g
^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+1/2*d/i^3/(a*d-b*c)^5/
g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+2*d^3/i^3/(a*d-b*c)
^5/g^2*A*b/(d*x+c)*a^2-1/4*d/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*b^3*c^3+e/i^3/
(a*d-b*c)^5/g^2*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+e/i^3/(a*d-b*c)
^5/g^2*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+2*d/i^3/(a*d-b*c)^5/g^2*
A*b^3/(d*x+c)*c^2+1/2*d/i^3/(a*d-b*c)^5/g^2*A/(d*x+c)^2*b^3*c^3-5/2*d^3/i^3
/(a*d-b*c)^5/g^2*B*b/(d*x+c)*a^2-5/2*d/i^3/(a*d-b*c)^5/g^2*B*b^3/(d*x+c)*c^
2+3/2*d/i^3/(a*d-b*c)^5/g^2*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+1/4*d
^4/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*a^3-1/2*d^4/i^3/(a*d-b*c)^5/g^2*A/(d*x+c
)^2*a^3-4*d^2/i^3/(a*d-b*c)^5/g^2*A*b^2/(d*x+c)*a*c-3/2*d^2/i^3/(a*d-b*c)^5
/g^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-3*d^2/i^3/(a*d-b*c)^5/g^2*A*
b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*d^4/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3+5/2*d^2/i^3/(a*d-b*c)^5/g^2*B*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-5/2*d/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*b^3*c+3*d/i^3/(a*d-b*c)^5/g^2*A*b^3*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*c
```

Maxima [B] time = 1.90353, size = 2323, normalized size = 6.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] -1/2*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a
*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g
```

```
^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d
^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*
a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a
^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a
*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*
d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^
3 + a^4*d^4)*g^2*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/2*A*((6*b^2
*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b
^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + (
2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*
g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3
- 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 -
 a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6
*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c)
/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g
^2*i^3)) - 1/4*(4*b^3*c^3 - 15*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(
b^3*c*d^2 - a*b^2*d^3)*x^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 +
a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(b^3*d^3
*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c
*d^2)*x)*log(d*x + c)^2 - 3*(b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6
*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d +
2*a*b^2*c*d^2)*x)*log(b*x + a) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^
2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2
*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log
(b*x + a))*log(d*x + c))*B/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6
*a^3*b^2*c^4*d^2*g^2*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 +
(b^5*c^4*d^2*g^2*i^3 - 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3
- 4*a^3*b^2*c*d^5*g^2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 -
 7*a*b^4*c^4*d^2*g^2*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^
2*i^3 - 2*a^4*b*c*d^5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2
*a*b^4*c^5*d*g^2*i^3 - 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^
3 - 7*a^4*b*c^2*d^4*g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x)
```

Fricas [A] time = 0.567175, size = 1368, normalized size = 3.75

$$-\frac{4\,(A+B)b^3c^3 + 3\,(2\,A-5\,B)ab^2c^2d - 12\,(A-B)a^2bcd^2 + (2\,A-B)a^3d^3 + 6\left((2\,A-B)b^3cd^2 - (2\,A-B)ab^2d^3\right)x^2 + 6\left(\cdots\right.}{4\left(\left(b^5c^4d^2 - 4\,ab^4c^3d^3 + 6\,a^2b^3c^2d^4 - \cdots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] -1/4*(4*(A + B)*b^3*c^3 + 3*(2*A - 5*B)*a*b^2*c^2*d - 12*(A - B)*a^2*b*c*d^
2 + (2*A - B)*a^3*d^3 + 6*((2*A - B)*b^3*c*d^2 - (2*A - B)*a*b^2*d^3)*x^2 +
 6*(B*b^3*d^3*x^3 + B*a*b^2*c^2*d + (2*B*b^3*c*d^2 + B*a*b^2*d^3)*x^2 + (B*
b^3*c^2*d + 2*B*a*b^2*c*d^2)*x)*log((b*e*x + a*e)/(d*x + c))^2 + 3*((6*A -
B)*b^3*c^2*d - 2*(2*A + B)*a*b^2*c*d^2 - (2*A - 3*B)*a^2*b*d^3)*x + 2*(3*(2
*A - B)*b^3*d^3*x^3 + 2*B*b^3*c^3 + 6*A*a*b^2*c^2*d - 6*B*a^2*b*c*d^2 + B*a
^3*d^3 + 3*(4*A*b^3*c*d^2 + (2*A - 3*B)*a*b^2*d^3)*x^2 + 3*(2*(A + B)*b^3*c
^2*d + 4*(A - B)*a*b^2*c*d^2 - B*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c))
)/((b^5*c^4*d^2 - 4*a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a
^4*b*d^6)*g^2*i^3*x^3 + (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3
- 2*a^3*b^2*c^2*d^4 - 2*a^4*b*c*d^5 + a^5*d^6)*g^2*i^3*x^2 + (b^5*c^6 - 2*a
*b^4*c^5*d - 2*a^2*b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^
5*c*d^5)*g^2*i^3*x + (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a
```

```
^4*b*c^3*d^3 + a^5*c^2*d^4)*g^2*i^3)
```

Sympy [B] time = 33.0362, size = 1562, normalized size = 4.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2/(d*i*x+c*i)**3,x)
```

```
[Out] -3*B*b**2*d*log(e*(a + b*x)/(c + d*x))**2/(2*a**4*d**4*g**2*i**3 - 8*a**3*b
*c*d**3*g**2*i**3 + 12*a**2*b**2*c**2*d**2*g**2*i**3 - 8*a*b**3*c**3*d*g**2
*i**3 + 2*b**4*c**4*g**2*i**3) + 3*b**2*d*(2*A - B)*log(x + (6*A*a*b**2*d**
2 + 6*A*b**3*c*d - 3*B*a*b**2*d**2 - 3*B*b**3*c*d - 3*a**5*b**2*d**6*(2*A -
 B)/(a*d - b*c)**4 + 15*a**4*b**3*c*d**5*(2*A - B)/(a*d - b*c)**4 - 30*a**3
*b**4*c**2*d**4*(2*A - B)/(a*d - b*c)**4 + 30*a**2*b**5*c**3*d**3*(2*A - B)
/(a*d - b*c)**4 - 15*a*b**6*c**4*d**2*(2*A - B)/(a*d - b*c)**4 + 3*b**7*c**
5*d*(2*A - B)/(a*d - b*c)**4)/(12*A*b**3*d**2 - 6*B*b**3*d**2))/(2*g**2*i**
3*(a*d - b*c)**4) - 3*b**2*d*(2*A - B)*log(x + (6*A*a*b**2*d**2 + 6*A*b**3*
c*d - 3*B*a*b**2*d**2 - 3*B*b**3*c*d + 3*a**5*b**2*d**6*(2*A - B)/(a*d - b*
c)**4 - 15*a**4*b**3*c*d**5*(2*A - B)/(a*d - b*c)**4 + 30*a**3*b**4*c**2*d*
*4*(2*A - B)/(a*d - b*c)**4 - 30*a**2*b**5*c**3*d**3*(2*A - B)/(a*d - b*c)*
*4 + 15*a*b**6*c**4*d**2*(2*A - B)/(a*d - b*c)**4 - 3*b**7*c**5*d*(2*A - B)
/(a*d - b*c)**4)/(12*A*b**3*d**2 - 6*B*b**3*d**2))/(2*g**2*i**3*(a*d - b*c)
**4) + (-B*a**2*d**2 + 5*B*a*b*c*d + 3*B*a*b*d**2*x + 2*B*b**2*c**2 + 9*B*b
**2*c*d*x + 6*B*b**2*d**2*x**2)*log(e*(a + b*x)/(c + d*x))/(2*a**4*c**2*d**
3*g**2*i**3 + 4*a**4*c*d**4*g**2*i**3*x + 2*a**4*d**5*g**2*i**3*x**2 - 6*a*
*3*b*c**3*d**2*g**2*i**3 - 10*a**3*b*c**2*d**3*g**2*i**3*x - 2*a**3*b*c*d**
4*g**2*i**3*x**2 + 2*a**3*b*d**5*g**2*i**3*x**3 + 6*a**2*b**2*c**4*d*g**2*i
**3 + 6*a**2*b**2*c**3*d**2*g**2*i**3*x - 6*a**2*b**2*c**2*d**3*g**2*i**3*x
**2 - 6*a**2*b**2*c*d**4*g**2*i**3*x**3 - 2*a*b**3*c**5*g**2*i**3 + 2*a*b**
3*c**4*d*g**2*i**3*x + 10*a*b**3*c**3*d**2*g**2*i**3*x**2 + 6*a*b**3*c**2*d
**3*g**2*i**3*x**3 - 2*b**4*c**5*g**2*i**3*x - 4*b**4*c**4*d*g**2*i**3*x**2
 - 2*b**4*c**3*d**2*g**2*i**3*x**3) + (-2*A*a**2*d**2 + 10*A*a*b*c*d + 4*A*
b**2*c**2 + B*a**2*d**2 - 11*B*a*b*c*d + 4*B*b**2*c**2 + x**2*(12*A*b**2*d*
*2 - 6*B*b**2*d**2) + x*(6*A*a*b*d**2 + 18*A*b**2*c*d - 9*B*a*b*d**2 - 3*B*
b**2*c*d))/(4*a**4*c**2*d**3*g**2*i**3 - 12*a**3*b*c**3*d**2*g**2*i**3 + 12
*a**2*b**2*c**4*d*g**2*i**3 - 4*a*b**3*c**5*g**2*i**3 + x**3*(4*a**3*b*d**5
*g**2*i**3 - 12*a**2*b**2*c*d**4*g**2*i**3 + 12*a*b**3*c**2*d**3*g**2*i**3
- 4*b**4*c**3*d**2*g**2*i**3) + x**2*(4*a**4*d**5*g**2*i**3 - 4*a**3*b*c*d*
*4*g**2*i**3 - 12*a**2*b**2*c**2*d**3*g**2*i**3 + 20*a*b**3*c**3*d**2*g**2*
i**3 - 8*b**4*c**4*d*g**2*i**3) + x*(8*a**4*c*d**4*g**2*i**3 - 20*a**3*b*c*
*2*d**3*g**2*i**3 + 12*a**2*b**2*c**3*d**2*g**2*i**3 + 4*a*b**3*c**4*d*g**2
*i**3 - 4*b**4*c**5*g**2*i**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right) + A}{\left(bgx + ag\right)^2 (dix + ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)
^3), x)
```

3.53 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=463

$$\frac{6b^2d^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^3(bc-ad)^5}-\frac{b^4(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3d(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^3(a+bx)(bc-ad)^5}-\frac{4bd}{}$$

```
[Out] -(B*d^4*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (4*b*B*d^3*(a
+ b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*B*d*(c + d*x))/((b*c - a
*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*(c + d*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(a
+ b*x)^2) - (3*b^2*B*d^2*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i^3
) + (d^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^5
*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(c + d*x)^
2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^
2) + (6*b^2*d^2*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/((b*c - a*d)^5*g^3*i^3)
```

Rubi [C] time = 1.40576, antiderivative size = 673, normalized size of antiderivative = 1.45, number of steps used = 36, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{6b^2Bd^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5}+\frac{6b^2Bd^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5}+\frac{6b^2d^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i^3(bc-ad)^5}-\frac{6b^2d^2\log(c}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*x)^3),
x]
```

```
[Out] -(b^2*B)/(4*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (7*b^2*B*d)/(2*(b*c - a*d)
^4*g^3*i^3*(a + b*x)) - (B*d^2)/(4*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) - (7*
b*B*d^2)/(2*(b*c - a*d)^4*g^3*i^3*(c + d*x)) - (3*b^2*B*d^2*Log[a + b*x]^2)
/((b*c - a*d)^5*g^3*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b
*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d
*x)]))/((b*c - a*d)^4*g^3*i^3*(a + b*x)) + (d^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) + (3*b*d^2*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^3*i^3*(c + d*x)) + (6*b^2*d^2*Log[a
 + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3) + (6*
b^2*B*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^
3*i^3) - (6*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*
c - a*d)^5*g^3*i^3) - (3*b^2*B*d^2*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3)
+ (6*b^2*B*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*
g^3*i^3) + (6*b^2*B*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a
*d)^5*g^3*i^3) + (6*b^2*B*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c
- a*d)^5*g^3*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(53c+53dx)^3(ag+bgx)^3}\,dx = \int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)^2} + \frac{6b^3d^2\left(A+B\log\right.}{148877(bc-ad}\right.$$

$$= \frac{\left(6b^3d^2\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{148877(bc-ad)^5g^3} - \frac{\left(6b^2d^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{148877(bc-ad)^5g^3} - \frac{\left(3b^3d\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}}{148877(bc-ad)^4g}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\log\right.}{297754(bc-ad)^3g}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\log\right.}{297754(bc-ad)^3g}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\log\right.}{297754(bc-ad)^3g}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{Bd^2}{595508(bc-ad)^3g}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{Bd^2}{595508(bc-ad)^3g}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{Bd^2}{595508(bc-ad)^3g}$$

$$= -\frac{b^2B}{595508(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd}{297754(bc-ad)^4g^3(a+bx)} - \frac{Bd^2}{595508(bc-ad)^3g}$$

Mathematica [C] time = 1.27403, size = 533, normalized size = 1.15

$$-\frac{12b^2Bd^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-12b^2Bd^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\text{lo}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^3*(c*i + d*i*
x)^3),x]
```

```
[Out] -((b^2*B*(b*c - a*d)^2)/(a + b*x)^2 - (12*b^3*B*c*d)/(a + b*x) + (12*a*b^2*
B*d^2)/(a + b*x) - (2*b^2*B*d*(b*c - a*d))/(a + b*x) + (B*d^2*(b*c - a*d)^2
)/(c + d*x)^2 + (12*b^2*B*c*d^2)/(c + d*x) - (12*a*b*B*d^3)/(c + d*x) + (2*
```

```
b*B*d^2*(b*c - a*d))/(c + d*x) + (2*b^2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(a + b*x)^2 - (12*b^2*d*(b*c - a*d)*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(a + b*x) - (2*d^2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(c + d*x)^2 - (12*b*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(c + d*x) - 24*b^2*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]) + 24*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 1
2*b^2*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
 - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 12*b^2*B*d^2*((2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^5*g^3*i^3)
```

Maple [B] time = 0.058, size = 2182, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] 7/2*d^3/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-7/2*d^2
/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c+6*d^2/i^3/(a*d
-b*c)^6/g^3*A*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3*d^3/i^3/(a*d-b*c)^6/g
^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+3*d^2/i^3/(a*d-b*c)^6/g^3*B*b^
3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/2*d^5/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-6*d^3/i^3/(a*d-b*c)^6/g^3*A*b^2*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/2*d^2/i^3/(a*d-b*c)^6/g^3*A/(d*x+c)^2*b^3*c
^3-1/4*d^2/i^3/(a*d-b*c)^6/g^3*B/(d*x+c)^2*b^3*c^3-1/2*e^2/i^3/(a*d-b*c)^6/
g^3*A*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/4*e^2/i^3/(a*d-b*c)^6/g
^3*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+3*d^4/i^3/(a*d-b*c)^6/g^3*
A*b/(d*x+c)*a^2-7/2*d^2/i^3/(a*d-b*c)^6/g^3*B*b^3/(d*x+c)*c^2-7/2*d^4/i^3/(
a*d-b*c)^6/g^3*B*b/(d*x+c)*a^2+3*d^2/i^3/(a*d-b*c)^6/g^3*A*b^3/(d*x+c)*c^2-
15/4*d^3/i^3/(a*d-b*c)^6/g^3*B*b^2*a+15/4*d^2/i^3/(a*d-b*c)^6/g^3*B*b^3*c+7
/2*d^3/i^3/(a*d-b*c)^6/g^3*A*b^2*a-7/2*d^2/i^3/(a*d-b*c)^6/g^3*A*b^3*c-6*d^
3/i^3/(a*d-b*c)^6/g^3*A*b^2/(d*x+c)*a*c+1/2*d^2/i^3/(a*d-b*c)^6/g^3*B*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3-6*d^3/i^3/(a*d-b*c)^6/g^3*B*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*c*a-4*e*d^2/i^3/(a*d-b*c)^6/g^3*B
*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+
4*e*d/i^3/(a*d-b*c)^6/g^3*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*c+1/2*e^2*d/i^3/(a*d-b*c)^6/g^3*B*b^4/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3/2*d^4/i^3/(a*
d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d^3/i^
3/(a*d-b*c)^6/g^3*A/(d*x+c)^2*a*b^2*c^2-3/4*d^4/i^3/(a*d-b*c)^6/g^3*B/(d*x+
c)^2*a^2*b*c+1/4*d^5/i^3/(a*d-b*c)^6/g^3*B/(d*x+c)^2*a^3-1/2*d^5/i^3/(a*d-b
*c)^6/g^3*A/(d*x+c)^2*a^3+1/2*e^2*d/i^3/(a*d-b*c)^6/g^3*A*b^4/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*a+3*d^2/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*b^3/(d*x+c)*c^2+3*d^4/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*b/(d*x+c)*a^2+1/4*e^2*d/i^3/(a*d-b*c)^6/g^3*B*b^4/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)^2*a+7*d^3/i^3/(a*d-b*c)^6/g^3*B*b^2/(d*x+c)*c*a+3/4
*d^3/i^3/(a*d-b*c)^6/g^3*B/(d*x+c)^2*b^2*c^2*a-4*e*d^2/i^3/(a*d-b*c)^6/g^3*
A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+4*e*d/i^3/(a*d-b*c)^6/g^3*A*b^4
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-4*e*d^2/i^3/(a*d-b*c)^6/g^3*B*b^3/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+4*e*d/i^3/(a*d-b*c)^6/g^3*B*b^4/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3/2*d^4/i^3/(a*d-b*c)^6/g^3*A/(d*x+c)^2*a^2*
b*c-1/2*e^2/i^3/(a*d-b*c)^6/g^3*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3/2*d^3/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2
```

Maxima [B] time = 2.0952, size = 3213, normalized size = 6.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] 1/2*B*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3
+ 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3
)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5
+ a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3
*d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*
c^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)
*g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b
^2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*
b^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 1
2*b^2*d^2*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*
a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x +
c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*
a^4*b*c*d^4 - a^5*d^5)*g^3*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1/2
*A*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 1
8*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x
)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 + a
^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*d^
3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c^6
 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)*g^
3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^2*
c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b^3
*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 12*b
^2*d^2*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3
*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x + c)/
((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4
*b*c*d^4 - a^5*d^5)*g^3*i^3)) - 1/4*(b^4*c^4 - 16*a*b^3*c^3*d + 30*a^2*b^2*
c^2*d^2 - 16*a^3*b*c*d^3 + a^4*d^4 - 12*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*
b^2*d^4)*x^2 + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4
)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2
+ a^2*b^2*c*d^3)*x)*log(b*x + a)^2 - 24*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*
(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x
^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*x + c) + 12*(b
^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2
 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*
log(d*x + c)^2 - 12*(b^4*c^3*d - a*b^3*c^2*d^2 - a^2*b^2*c*d^3 + a^3*b*d^4)
*x)*B/(a^2*b^5*c^7*g^3*i^3 - 5*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g
^3*i^3 - 10*a^5*b^2*c^4*d^3*g^3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5
*g^3*i^3 + (b^7*c^5*d^2*g^3*i^3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*
d^4*g^3*i^3 - 10*a^3*b^4*c^2*d^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^
2*d^7*g^3*i^3)*x^4 + 2*(b^7*c^6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2
*b^5*c^4*d^3*g^3*i^3 - 5*a^4*b^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3
- a^6*b*d^7*g^3*i^3)*x^3 + (b^7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b
^5*c^5*d^2*g^3*i^3 + 25*a^3*b^4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^
3 + 9*a^5*b^2*c^2*d^5*g^3*i^3 + a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2
+ 2*(a*b^6*c^7*g^3*i^3 - 4*a^2*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^
3 - 5*a^5*b^2*c^3*d^4*g^3*i^3 + 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3
)*x)
```

Fricas [B] time = 0.6042, size = 2037, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] -1/4*((2*A + B)*b^4*c^4 - 16*(A + B)*a*b^3*c^3*d + 30*B*a^2*b^2*c^2*d^2 + 1
6*(A - B)*a^3*b*c*d^3 - (2*A - B)*a^4*d^4 - 24*(A*b^4*c*d^3 - A*a*b^3*d^4)*
x^3 - 12*((3*A + B)*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3 - (3*A - B)*a^2*b^2*d^4)*
x^2 - 12*(B*b^4*d^4*x^4 + B*a^2*b^2*c^2*d^2 + 2*(B*b^4*c*d^3 + B*a*b^3*d^4)
*x^3 + (B*b^4*c^2*d^2 + 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*x^2 + 2*(B*a*b^3*c
^2*d^2 + B*a^2*b^2*c*d^3)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 4*((2*A + 3*B
)*b^4*c^3*d + 3*(4*A - B)*a*b^3*c^2*d^2 - 3*(4*A + B)*a^2*b^2*c*d^3 - (2*A
- 3*B)*a^3*b*d^4)*x - 2*(12*A*b^4*d^4*x^4 - B*b^4*c^4 + 8*B*a*b^3*c^3*d + 1
2*A*a^2*b^2*c^2*d^2 - 8*B*a^3*b*c*d^3 + B*a^4*d^4 + 12*((2*A + B)*b^4*c*d^3
 + (2*A - B)*a*b^3*d^4)*x^3 + 6*((2*A + 3*B)*b^4*c^2*d^2 + 8*A*a*b^3*c*d^3
+ (2*A - 3*B)*a^2*b^2*d^4)*x^2 + 4*(B*b^4*c^3*d + 6*(A + B)*a*b^3*c^2*d^2 +
 6*(A - B)*a^2*b^2*c*d^3 - B*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x + c)))/((
b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2*d^5 + 5
*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*i^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6*c^5*d^2
+ 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d^7)*g^3*
i^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c^4*d^3 -
 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^3*i^3*x^
2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*c^3*d^4
+ 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*i^3*x + (a^2*b^5*c^7 - 5*a^3*b^4*c^6*d +
 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^2*d^5)*g
^3*i^3)
```

Sympy [B] time = 65.1957, size = 2106, normalized size = 4.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3/(d*i*x+c*i)**3,x)
```

```
[Out] 6*A*b**2*d**2*log(x + (-6*A*a**6*b**2*d**8/(a*d - b*c)**5 + 36*A*a**5*b**3*
c*d**7/(a*d - b*c)**5 - 90*A*a**4*b**4*c**2*d**6/(a*d - b*c)**5 + 120*A*a**
3*b**5*c**3*d**5/(a*d - b*c)**5 - 90*A*a**2*b**6*c**4*d**4/(a*d - b*c)**5 +
 36*A*a*b**7*c**5*d**3/(a*d - b*c)**5 + 6*A*a*b**2*d**3 - 6*A*b**8*c**6*d**
2/(a*d - b*c)**5 + 6*A*b**3*c*d**2)/(12*A*b**3*d**3))/(g**3*i**3*(a*d - b*c
)**5) - 6*A*b**2*d**2*log(x + (6*A*a**6*b**2*d**8/(a*d - b*c)**5 - 36*A*a**
5*b**3*c*d**7/(a*d - b*c)**5 + 90*A*a**4*b**4*c**2*d**6/(a*d - b*c)**5 - 12
0*A*a**3*b**5*c**3*d**5/(a*d - b*c)**5 + 90*A*a**2*b**6*c**4*d**4/(a*d - b*
c)**5 - 36*A*a*b**7*c**5*d**3/(a*d - b*c)**5 + 6*A*a*b**2*d**3 + 6*A*b**8*c
**6*d**2/(a*d - b*c)**5 + 6*A*b**3*c*d**2)/(12*A*b**3*d**3))/(g**3*i**3*(a*
d - b*c)**5) - 3*B*b**2*d**2*log(e*(a + b*x)/(c + d*x))**2/(a**5*d**5*g**3*
i**3 - 5*a**4*b*c*d**4*g**3*i**3 + 10*a**3*b**2*c**2*d**3*g**3*i**3 - 10*a*
*2*b**3*c**3*d**2*g**3*i**3 + 5*a*b**4*c**4*d*g**3*i**3 - b**5*c**5*g**3*i*
*3) + (-B*a**3*d**3 + 7*B*a**2*b*c*d**2 + 4*B*a**2*b*d**3*x + 7*B*a*b**2*c*
*2*d + 28*B*a*b**2*c*d**2*x + 18*B*a*b**2*d**3*x**2 - B*b**3*c**3 + 4*B*b**
3*c**2*d*x + 18*B*b**3*c*d**2*x**2 + 12*B*b**3*d**3*x**3)*log(e*(a + b*x)/(
c + d*x))/(2*a**6*c**2*d**4*g**3*i**3 + 4*a**6*c*d**5*g**3*i**3*x + 2*a**6*
```

```
d**6*g**3*i**3*x**2 - 8*a**5*b*c**3*d**3*g**3*i**3 - 12*a**5*b*c**2*d**4*g*
*3*i**3*x + 4*a**5*b*d**6*g**3*i**3*x**3 + 12*a**4*b**2*c**4*d**2*g**3*i**3
 + 8*a**4*b**2*c**3*d**3*g**3*i**3*x - 18*a**4*b**2*c**2*d**4*g**3*i**3*x**
2 - 12*a**4*b**2*c*d**5*g**3*i**3*x**3 + 2*a**4*b**2*d**6*g**3*i**3*x**4 -
8*a**3*b**3*c**5*d*g**3*i**3 + 8*a**3*b**3*c**4*d**2*g**3*i**3*x + 32*a**3*
b**3*c**3*d**3*g**3*i**3*x**2 + 8*a**3*b**3*c**2*d**4*g**3*i**3*x**3 - 8*a*
*3*b**3*c*d**5*g**3*i**3*x**4 + 2*a**2*b**4*c**6*g**3*i**3 - 12*a**2*b**4*c
**5*d*g**3*i**3*x - 18*a**2*b**4*c**4*d**2*g**3*i**3*x**2 + 8*a**2*b**4*c**
3*d**3*g**3*i**3*x**3 + 12*a**2*b**4*c**2*d**4*g**3*i**3*x**4 + 4*a*b**5*c*
*6*g**3*i**3*x - 12*a*b**5*c**4*d**2*g**3*i**3*x**3 - 8*a*b**5*c**3*d**3*g*
*3*i**3*x**4 + 2*b**6*c**6*g**3*i**3*x**2 + 4*b**6*c**5*d*g**3*i**3*x**3 +
2*b**6*c**4*d**2*g**3*i**3*x**4) + (-2*A*a**3*d**3 + 14*A*a**2*b*c*d**2 + 1
4*A*a*b**2*c**2*d - 2*A*b**3*c**3 + 24*A*b**3*d**3*x**3 + B*a**3*d**3 - 15*
B*a**2*b*c*d**2 + 15*B*a*b**2*c**2*d - B*b**3*c**3 + x**2*(36*A*a*b**2*d**3
 + 36*A*b**3*c*d**2 - 12*B*a*b**2*d**3 + 12*B*b**3*c*d**2) + x*(8*A*a**2*b*
d**3 + 56*A*a*b**2*c*d**2 + 8*A*b**3*c**2*d - 12*B*a**2*b*d**3 + 12*B*b**3*
c**2*d))/(4*a**6*c**2*d**4*g**3*i**3 - 16*a**5*b*c**3*d**3*g**3*i**3 + 24*a
**4*b**2*c**4*d**2*g**3*i**3 - 16*a**3*b**3*c**5*d*g**3*i**3 + 4*a**2*b**4*
c**6*g**3*i**3 + x**4*(4*a**4*b**2*d**6*g**3*i**3 - 16*a**3*b**3*c*d**5*g**
3*i**3 + 24*a**2*b**4*c**2*d**4*g**3*i**3 - 16*a*b**5*c**3*d**3*g**3*i**3 +
 4*b**6*c**4*d**2*g**3*i**3) + x**3*(8*a**5*b*d**6*g**3*i**3 - 24*a**4*b**2
*c*d**5*g**3*i**3 + 16*a**3*b**3*c**2*d**4*g**3*i**3 + 16*a**2*b**4*c**3*d*
*3*g**3*i**3 - 24*a*b**5*c**4*d**2*g**3*i**3 + 8*b**6*c**5*d*g**3*i**3) + x
**2*(4*a**6*d**6*g**3*i**3 - 36*a**4*b**2*c**2*d**4*g**3*i**3 + 64*a**3*b**
3*c**3*d**3*g**3*i**3 - 36*a**2*b**4*c**4*d**2*g**3*i**3 + 4*b**6*c**6*g**3
*i**3) + x*(8*a**6*c*d**5*g**3*i**3 - 24*a**5*b*c**2*d**4*g**3*i**3 + 16*a*
*4*b**2*c**3*d**3*g**3*i**3 + 16*a**3*b**3*c**4*d**2*g**3*i**3 - 24*a**2*b*
*4*c**5*d*g**3*i**3 + 8*a*b**5*c**6*g**3*i**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{\left(bgx+ag\right)^3(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^3*(d*i*x + c*i)
^3), x)
```

3.54 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=563

$$-\frac{10b^3d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^3(a+bx)(bc-ad)^6}-\frac{10b^2d^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^3(bc-ad)^6}-\frac{b^5(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4i^3(a+bx)^3(bc-ad)^6}+\frac{5b\ldots}{\ldots}$$

```
[Out] (B*d^5*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (5*b*B*d^4*(a +
 b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*B*d^2*(c + d*x))/((b*c -
 a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*(c + d*x)^2)/(4*(b*c - a*d)^6*g^4*i
^3*(a + b*x)^2) - (b^5*B*(c + d*x)^3)/(9*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3)
 + (5*b^2*B*d^3*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) - (d^5*
(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^6*g^4*i^3*
(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b
*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*d*(c + d*x)^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2)
 - (b^5*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^6*
g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/((b*c - a*d)^6*g^4*i^3)
```

Rubi [C] time = 1.69534, antiderivative size = 825, normalized size of antiderivative = 1.47, number of steps used = 40, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{5b^2B\log^2(a+bx)d^3}{(bc-ad)^6g^4i^3}+\frac{5b^2B\log^2(c+dx)d^3}{(bc-ad)^6g^4i^3}-\frac{10b^2B\log(a+bx)d^3}{3(bc-ad)^6g^4i^3}-\frac{10b^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^3}{(bc-ad)^6g^4i^3}-\frac{4b\left(A+\ldots\right)}{(bc-\ldots)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*x)^3),
x]
```

```
[Out] -(b^2*B)/(9*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (11*b^2*B*d)/(12*(b*c - a*
d)^4*g^4*i^3*(a + b*x)^2) - (47*b^2*B*d^2)/(6*(b*c - a*d)^5*g^4*i^3*(a + b*
x)) + (B*d^3)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B*d^3)/(2*(b*c -
 a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*B*d^3*Log[a + b*x])/(3*(b*c - a*d)^6*g
^4*i^3) + (5*b^2*B*d^3*Log[a + b*x]^2)/((b*c - a*d)^6*g^4*i^3) - (b^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (3
*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^4*i^3*(a +
b*x)^2) - (6*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g
^4*i^3*(a + b*x)) - (d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*
d)^4*g^4*i^3*(c + d*x)^2) - (4*b*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*d^3*Log[a + b*x]*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B*d^3*Log[c + d*x
])/(3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) + (10*b^2*d^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) + (5*b^2*B*d^3*Log[
c + d*x]^2)/((b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*Log[a + b*x]*Log[(b*(c
+ d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(54c+54dx)^3(ag+bgx)^4}\,dx = \int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{157464(bc-ad)^3g^4(a+bx)^4} - \frac{b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{52488(bc-ad)^4g^4(a+bx)^3} + \frac{b^3d^2\left(A+B\log\left(\frac{e}{}\right.\right.}{26244(bc-ad)^5g^4(}\right.$$

$$= -\frac{\left(5b^3d^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{78732(bc-ad)^6g^4} + \frac{\left(5b^2d^4\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{78732(bc-ad)^6g^4} + \frac{\left(b^3d^2\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}}{26244(bc-ad)^5g^4}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{472392(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{104976(bc-ad)^4g^4(a+bx)^2} - \frac{b^2d^2\left(A+B\log\left(\frac{e(a-}{c+}\right.\right.}{26244(bc-ad)^5g^4(a}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{472392(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{104976(bc-ad)^4g^4(a+bx)^2} - \frac{b^2d^2\left(A+B\log\left(\frac{e(a-}{c+}\right.\right.}{26244(bc-ad)^5g^4(a}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{472392(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{104976(bc-ad)^4g^4(a+bx)^2} - \frac{b^2d^2\left(A+B\log\left(\frac{e(a-}{c+}\right.\right.}{26244(bc-ad)^5g^4(a}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{47b^2Bd^2}{944784(bc-ad)^5g}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{47b^2Bd^2}{944784(bc-ad)^5g}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{47b^2Bd^2}{944784(bc-ad)^5g}$$

$$= -\frac{b^2B}{1417176(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bd}{1889568(bc-ad)^4g^4(a+bx)^2} - \frac{47b^2Bd^2}{944784(bc-ad)^5g}$$

Mathematica [C] time = 1.99388, size = 637, normalized size = 1.13

$$-\frac{-180b^2Bd^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+180b^2Bd^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+1\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/((a*g + b*g*x)^4*(c*i + d*i*
x)^3),x]
```

```
[Out] -((4*b^2*B*(b*c - a*d)^3)/(a + b*x)^3 - (33*b^2*B*d*(b*c - a*d)^2)/(a + b*x
)^2 + (216*b^3*B*c*d^2)/(a + b*x) - (216*a*b^2*B*d^3)/(a + b*x) + (66*b^2*B
```

```
*d^2*(b*c - a*d))/(a + b*x) - (9*B*d^3*(b*c - a*d)^2)/(c + d*x)^2 - (144*b^
2*B*c*d^3)/(c + d*x) + (144*a*b*B*d^4)/(c + d*x) - (18*b*B*d^3*(b*c - a*d))
/(c + d*x) + 120*b^2*B*d^3*Log[a + b*x] + (12*b^2*(b*c - a*d)^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(a + b*x)^3 - (54*b^2*d*(b*c - a*d)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (216*b^2*d^2*(b*c - a*d)*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(a + b*x) + (18*d^3*(b*c - a*d)^2*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(c + d*x)^2 + (144*b*d^3*(b*c - a*d)*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 360*b^2*d^3*Log[a + b*x]*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) - 120*b^2*B*d^3*Log[c + d*x] - 360*b^2*d^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 180*b^2*B*d^3*(Log[a + b*x]*(
Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x
))/(-(b*c) + a*d)]) + 180*b^2*B*d^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
 Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(36
*(b*c - a*d)^6*g^4*i^3)
```

Maple [B] time = 0.054, size = 2616, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

```
[Out] -1/2*d^6/i^3/(a*d-b*c)^7/g^4*A/(d*x+c)^2*a^3-10*e*d^3/i^3/(a*d-b*c)^7/g^4*B
*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-1/3*e^3*d/i^3/(a*d-b*c)^7/g^4*A*
b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+5/4*e^2*d^2/i^3/(a*d-b*c)^7/g^4
*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/2*d^3/i^3/(a*d-b*c)^7/g^4*
B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+4*d^5/i^3/(a*d-b*c)^7/g
^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/3*e^3/i^3/(a*d-b*c)^7/
g^4*B*b^6/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))*c+5/2*e^2*d^2/i^3/(a*d-b*c)^7/g^4*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^2*a-5/4*e^2*d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^2*c+9/2*d^4/i^3/(a*d-b*c)^7/g^4*A*b^2*a-9/2*d^3/i^3/(a*d-b*c)^7/g^4*
A*b^3*c-19/4*d^4/i^3/(a*d-b*c)^7/g^4*B*b^2*a+19/4*d^3/i^3/(a*d-b*c)^7/g^4*B
*b^3*c-1/2*d^6/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c
)^2*a^3-5*d^4/i^3/(a*d-b*c)^7/g^4*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a
+9/2*d^4/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a+5*d^3/
i^3/(a*d-b*c)^7/g^4*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+10*d^3/i^3/(a
*d-b*c)^7/g^4*A*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-9/2*d^3/i^3/(a*d-b*c)
^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-10*d^4/i^3/(a*d-b*c)^7/g^4*A
*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*d^5/i^3/(a*d-b*c)^7/g^4*A*b/(d*x+c
)*a^2+4*d^3/i^3/(a*d-b*c)^7/g^4*A*b^3/(d*x+c)*c^2-1/4*d^3/i^3/(a*d-b*c)^7/g
^4*B/(d*x+c)^2*b^3*c^3+1/3*e^3/i^3/(a*d-b*c)^7/g^4*A*b^6/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^3*c-9/2*d^3/i^3/(a*d-b*c)^7/g^4*B*b^3/(d*x+c)*c^2-1/3*e^3
*d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*a+5/2*e^2*d^2/i^3/(a*d-b*c)^7/g^4*B*b^4/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-10*e*d^3/i^3/(
a*d-b*c)^7/g^4*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+10*e*d^2/i^3/(a*
d-b*c)^7/g^4*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-10*e*d^3/i^3/(a*d-
b*c)^7/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*a+10*e*d^2/i^3/(a*d-b*c)^7/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/9*e^3/i^3/(a*d-b*c)^7/g^4*B*b^6
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/2*d^3/i^3/(a*d-b*c)^7/g^4*A/(d*x
+c)^2*b^3*c^3-9/2*d^5/i^3/(a*d-b*c)^7/g^4*B*b/(d*x+c)*a^2+1/4*d^6/i^3/(a*d-
b*c)^7/g^4*B/(d*x+c)^2*a^3-1/9*e^3*d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)^3*a-8*d^4/i^3/(a*d-b*c)^7/g^4*A*b^2/(d*x+c)*c*a-3/2
*d^4/i^3/(a*d-b*c)^7/g^4*A/(d*x+c)^2*b^2*c^2*a+3/4*d^4/i^3/(a*d-b*c)^7/g^4*
```

```
B/(d*x+c)^2*b^2*c^2*a-3/4*d^5/i^3/(a*d-b*c)^7/g^4*B/(d*x+c)^2*a^2*b*c+9*d^4
/i^3/(a*d-b*c)^7/g^4*B*b^2/(d*x+c)*a*c+3/2*d^5/i^3/(a*d-b*c)^7/g^4*A/(d*x+c
)^2*a^2*b*c+4*d^3/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3
/(d*x+c)*c^2-5/2*e^2*d/i^3/(a*d-b*c)^7/g^4*A*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^2*c+10*e*d^2/i^3/(a*d-b*c)^7/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)*c-8*d^4/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2
/(d*x+c)*a*c-5/2*e^2*d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+3/2*d^5/i^3/(a*d-b*c)^7/g^4*B
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d^4/i^3/(a*d-b*c)^7/
g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2
```

Maxima [B] time = 3.54157, size = 5152, normalized size = 9.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] -1/6*B*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 +
 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^
4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*
c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*d^
3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d^7
)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a^3
*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4*i
^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3 -
 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^4*
i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c^4
*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g^4
*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^5*
b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*x
+ (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^3
+ 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*x + a)/((b^6*c
^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c
^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d*x + c)/((b^6*
c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*
c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x
 + c)) - 1/6*A*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c
^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 +
10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 1
1*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^
7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5
*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3
+ 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^
7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c
^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d
^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4
*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*
d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 -
 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^
4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*
c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*x + a)
/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a
^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d*x + c
)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*
```

```
a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3)) - 1/36*(4*b^5*c^5 - 45
*a*b^4*c^4*d + 360*a^2*b^3*c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4
- 9*a^5*d^5 + 120*(b^5*c*d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^
4*c*d^4 - a^2*b^3*d^5)*x^3 + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2
*b^3*c*d^4 + 7*a^3*b^2*d^5)*x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b
^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)
*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c
^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^
2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*
a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 +
(3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(d*x + c)^2 - 5*(5*b^5*c^4*d -
108*a*b^4*c^3*d^2 + 78*a^2*b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x
 + 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (
b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2
*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*lo
g(b*x + a) - 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^
5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d
^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*
d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4
 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6
*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x
)*log(b*x + a))*log(d*x + c))*B/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*
i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*
c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*
d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3
*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3
 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^
3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3
*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^
7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52
*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*
g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d
^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*
b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i
^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*
i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c
^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 1
2*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*
x)
```

Fricas [B] time = 0.661795, size = 3140, normalized size = 5.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] -1/36*(4*(3*A + B)*b^5*c^5 - 45*(2*A + B)*a*b^4*c^4*d + 360*(A + B)*a^2*b^3
*c^3*d^2 - 10*(12*A + 49*B)*a^3*b^2*c^2*d^3 - 180*(A - B)*a^4*b*c*d^4 + 9*(
2*A - B)*a^5*d^5 + 120*((3*A + B)*b^5*c*d^4 - (3*A + B)*a*b^4*d^5)*x^4 + 60
*(3*(3*A + 2*B)*b^5*c^2*d^3 + 2*(3*A - 2*B)*a*b^4*c*d^4 - (15*A + 2*B)*a^2*
b^3*d^5)*x^3 + 20*((6*A + 11*B)*b^5*c^3*d^2 + 21*(3*A + B)*a*b^4*c^2*d^3 -
3*(12*A + 13*B)*a^2*b^3*c*d^4 - (33*A - 7*B)*a^3*b^2*d^5)*x^2 + 180*(B*b^5*
d^5*x^5 + B*a^3*b^2*c^2*d^3 + (2*B*b^5*c*d^4 + 3*B*a*b^4*d^5)*x^4 + (B*b^5*
c^2*d^3 + 6*B*a*b^4*c*d^4 + 3*B*a^2*b^3*d^5)*x^3 + (3*B*a*b^4*c^2*d^3 + 6*B
```

```
*a^2*b^3*c*d^4 + B*a^3*b^2*d^5)*x^2 + (3*B*a^2*b^3*c^2*d^3 + 2*B*a^3*b^2*c*
d^4)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 5*((6*A + 5*B)*b^5*c^4*d - 36*(2*A
 + 3*B)*a*b^4*c^3*d^2 - 6*(24*A - 13*B)*a^2*b^3*c^2*d^3 + 4*(48*A + 13*B)*a
^3*b^2*c*d^4 + 9*(2*A - 3*B)*a^4*b*d^5)*x + 6*(20*(3*A + B)*b^5*d^5*x^5 + 2
*B*b^5*c^5 - 15*B*a*b^4*c^4*d + 60*B*a^2*b^3*c^3*d^2 + 60*A*a^3*b^2*c^2*d^3
 - 30*B*a^4*b*c*d^4 + 3*B*a^5*d^5 + 20*((6*A + 5*B)*b^5*c*d^4 + 9*A*a*b^4*d
^5)*x^4 + 10*((6*A + 11*B)*b^5*c^2*d^3 + 18*(2*A + B)*a*b^4*c*d^4 + 9*(2*A
- B)*a^2*b^3*d^5)*x^3 + 10*(2*B*b^5*c^3*d^2 + 9*(2*A + 3*B)*a*b^4*c^2*d^3 +
 36*A*a^2*b^3*c*d^4 + 3*(2*A - 3*B)*a^3*b^2*d^5)*x^2 - 5*(B*b^5*c^4*d - 12*
B*a*b^4*c^3*d^2 - 36*(A + B)*a^2*b^3*c^2*d^3 - 24*(A - B)*a^3*b^2*c*d^4 + 3
*B*a^4*b*d^5)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5*
d^3 + 15*a^2*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5*
b^4*c*d^7 + a^6*b^3*d^8)*g^4*i^3*x^5 + (2*b^9*c^7*d - 9*a*b^8*c^6*d^2 + 12*
a^2*b^7*c^5*d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 + 33*a^5*b^4*c^2*d
^6 - 16*a^6*b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*i^3*x^4 + (b^9*c^8 - 18*a^2*b^7*
c^6*d^2 + 52*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4 + 24*a^5*b^4*c^3*d^5 + 10
*a^6*b^3*c^2*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8)*g^4*i^3*x^3 + (3*a*b^8*c
^8 - 12*a^2*b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b^5*c^5*d^3 - 60*a^5*b^
4*c^4*d^4 + 52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 + a^9*d^8)*g^4*i^3*x^2
+ (3*a^2*b^7*c^8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2 - 30*a^5*b^4*c^5*d
^3 + 5*a^6*b^3*c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2*d^6 + 2*a^9*c*d^7
)*g^4*i^3*x + (a^3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6*d^2 - 20*a^6*
b^3*c^5*d^3 + 15*a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*d^6)*g^4*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{(bgx+ag)^4(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^4*(d*i*x + c*i)
^3), x)
```

3.55 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=539

$$-\frac{B^2g^3i(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{10b^2d^4}-\frac{Bg^3i(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+11B\right)}{60b^2d^4}-\frac{Bg^3i(a+bx)(bc$$

```
[Out] (3*B^2*(b*c - a*d)^4*g^3*i*x)/(10*b*d^3) - (3*B^2*(b*c - a*d)^3*g^3*i*(c +
d*x)^2)/(20*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i*(c + d*x)^3)/(30*d^4) - (B*(b
*c - a*d)^2*g^3*i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^2
*d) - (B*(b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(10*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/(20*b^2) + (g^3*i*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2)/(5*b) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^2*(3*A + B + 3*B*Log
[(e*(a + b*x))/(c + d*x)]))/(60*b^2*d^2) - (B*(b*c - a*d)^4*g^3*i*(a + b*x)
*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^2*d^3) - (B*(b*c - a
*d)^5*g^3*i*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11*B + 6*B*Log[(e*(a + b*
x))/(c + d*x)]))/(60*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*Log[c + d*x])/(10*
b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]
)/(10*b^2*d^4)
```

Rubi [A] time = 1.77985, antiderivative size = 622, normalized size of antiderivative = 1.15, number of steps used = 54, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3i(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{10b^2d^4}+\frac{Bg^3i(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{10b^2d^4}+\frac{Bg^3i(a+bx)^2(bc-ad)^3\left(B\right.}{20b^2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^4*g^3*i*x)/(10*b*d^3) + (B^2*(b*c - a*d)^4*g^3*i*x)/(60*b
*d^3) - (B^2*(b*c - a*d)^3*g^3*i*(a + b*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*
d)^2*g^3*i*(a + b*x)^3)/(30*b^2*d) - (B^2*(b*c - a*d)^4*g^3*i*(a + b*x)*Log
[(e*(a + b*x))/(c + d*x)])/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^
2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^2*d^2) - (B*(b*c - a*d)^2*g^3
*i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^2*d) - (B*(b*c -
 a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^2) + ((
b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b^2
) + (d*g^3*i*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*b^2) +
(B^2*(b*c - a*d)^5*g^3*i*Log[c + d*x])/(12*b^2*d^4) - (B^2*(b*c - a*d)^5*g^
3*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(10*b^2*d^4) + (B*(b*c
- a*d)^5*g^3*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(10*b^2*d
^4) + (B^2*(b*c - a*d)^5*g^3*i*Log[c + d*x]^2)/(20*b^2*d^4) - (B^2*(b*c - a
*d)^5*g^3*i*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(10*b^2*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (55c+55dx)(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx=\int\left(\frac{55(bc-ad)(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b}+\frac{55d(ag+$$

$$=\frac{(55(bc-ad))\int(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx}{b}+\frac{(55d)$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2}+\frac{11dg^3(a+bx$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2}+\frac{11dg^3(a+bx$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2}+\frac{11dg^3(a+bx$$

$$=\frac{55(bc-ad)g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2}+\frac{11dg^3(a+bx$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B(bc-ad)^3g^3(a+bx)^2\left(A+B\log\left(\right.\right.}{4b^2d^2}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}-\frac{11B^2(bc-ad)^4g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2b^2d^3}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}-\frac{11B^2(bc-ad)^4g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2b^2d^3}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-\frac{11B^2(bc-ad)^3g^3}{6b^2d^2}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-\frac{11B^2(bc-ad)^3g^3}{6b^2d^2}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-\frac{11B^2(bc-ad)^3g^3}{6b^2d^2}$$

$$=-\frac{11AB(bc-ad)^4g^3x}{2bd^3}+\frac{11B^2(bc-ad)^4g^3x}{12bd^3}-\frac{11B^2(bc-ad)^3g^3}{6b^2d^2}$$

Mathematica [A] time = 0.760173, size = 905, normalized size = 1.68

$$g^3i\left(4d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(a+bx)^5+5(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(a+bx)^4-\frac{5B(bc-ad)^2\left(-6B\log(c+dx)(bc-ad)^3-6\left(A+B\log\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g^3*i*(5*(b*c - a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
4*d*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (5*B*(b*c - a*d)^2
```

```
*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))
/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*
c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2
*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Lo
g[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4
) + (B*(b*c - a*d)*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*
x)*Log[(e*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*L
og[(e*(a + b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*
(a + b*x))/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*
x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x -
 d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*(b*
c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*
c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Log[c
 + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
 + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4))
)/(20*b^2)
```

Maple [F] time = 2.674, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3} (dix+ci) \left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.92535, size = 4301, normalized size = 7.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] 1/5*A^2*b^3*d*g^3*i*x^5 + 1/4*A^2*b^3*c*g^3*i*x^4 + 3/4*A^2*a*b^2*d*g^3*i*x
^4 + A^2*a*b^2*c*g^3*i*x^3 + A^2*a^2*b*d*g^3*i*x^3 + 3/2*A^2*a^2*b*c*g^3*i*
x^2 + 1/2*A^2*a^3*d*g^3*i*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
 a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^3*c*g^3*i + 3*(x^2*log(b*e*x/(d
*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b
*c - a*d)*x/(b*d))*A*B*a^2*b*c*g^3*i + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*
x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b
*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b^2*c*g^3*i + 1/12*(6
*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*
log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^
3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*c*g^3*i + (x^2*log(b*e
*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2
 - (b*c - a*d)*x/(b*d))*A*B*a^3*d*g^3*i + (2*x^3*log(b*e*x/(d*x + c) + a*e/
```

```
(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b*d*g^3*i + 1/4*
(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^
4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^2*d*g^3*i + 1/30*(12
*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^
5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*
b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b
^4*d^4))*A*B*b^3*d*g^3*i + A^2*a^3*c*g^3*i*x - 1/60*(6*a^4*c*d^4*g^3*i - (6
*g^3*i*log(e) + 5*g^3*i)*b^4*c^5 + (30*g^3*i*log(e) + 19*g^3*i)*a*b^3*c^4*d
 - (60*g^3*i*log(e) + 23*g^3*i)*a^2*b^2*c^3*d^2 + 3*(20*g^3*i*log(e) + g^3*
i)*a^3*b*c^2*d^3)*B^2*log(d*x + c)/(b*d^4) + 1/10*(b^5*c^5*g^3*i - 5*a*b^4*
c^4*d*g^3*i + 10*a^2*b^3*c^3*d^2*g^3*i - 10*a^3*b^2*c^2*d^3*g^3*i + 5*a^4*b
*c*d^4*g^3*i - a^5*d^5*g^3*i)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) +
 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^4) + 1/60*(12*B^2*b^5*d
^5*g^3*i*x^5*log(e)^2 + 3*((5*g^3*i*log(e)^2 - 2*g^3*i*log(e))*b^5*c*d^4 +
(15*g^3*i*log(e)^2 + 2*g^3*i*log(e))*a*b^4*d^5)*B^2*x^4 - 2*((g^3*i*log(e)
- g^3*i)*b^5*c^2*d^3 - 2*(15*g^3*i*log(e)^2 - 5*g^3*i*log(e) - g^3*i)*a*b^4
*c*d^4 - (30*g^3*i*log(e)^2 + 11*g^3*i*log(e) + g^3*i)*a^2*b^3*d^5)*B^2*x^3
 + ((3*g^3*i*log(e) - 2*g^3*i)*b^5*c^3*d^2 - 3*(5*g^3*i*log(e) - 4*g^3*i)*a
*b^4*c^2*d^3 + 3*(30*g^3*i*log(e)^2 - 5*g^3*i*log(e) - 6*g^3*i)*a^2*b^3*c*d
^4 + (30*g^3*i*log(e)^2 + 27*g^3*i*log(e) + 8*g^3*i)*a^3*b^2*d^5)*B^2*x^2 -
 ((6*g^3*i*log(e) - g^3*i)*b^5*c^4*d - 2*(15*g^3*i*log(e) - 4*g^3*i)*a*b^4*
c^3*d^2 + 12*(5*g^3*i*log(e) - 2*g^3*i)*a^2*b^3*c^2*d^3 - 2*(30*g^3*i*log(e
)^2 + 15*g^3*i*log(e) - 14*g^3*i)*a^3*b^2*c*d^4 - (6*g^3*i*log(e) + 11*g^3*
i)*a^4*b*d^5)*B^2*x + 3*(4*B^2*b^5*d^5*g^3*i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3
*i*x + 5*(b^5*c*d^4*g^3*i + 3*a*b^4*d^5*g^3*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^
3*i + a^2*b^3*d^5*g^3*i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*
g^3*i)*B^2*x^2 + (5*a^4*b*c*d^4*g^3*i - a^5*d^5*g^3*i)*B^2)*log(b*x + a)^2
+ 3*(4*B^2*b^5*d^5*g^3*i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3*i*x + 5*(b^5*c*d^4*
g^3*i + 3*a*b^4*d^5*g^3*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3*i + a^2*b^3*d^5*g^
3*i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*g^3*i)*B^2*x^2 - (b^
5*c^5*g^3*i - 5*a*b^4*c^4*d*g^3*i + 10*a^2*b^3*c^3*d^2*g^3*i - 10*a^3*b^2*c
^2*d^3*g^3*i)*B^2)*log(d*x + c)^2 + (24*B^2*b^5*d^5*g^3*i*x^5*log(e) + 6*((
5*g^3*i*log(e) - g^3*i)*b^5*c*d^4 + (15*g^3*i*log(e) + g^3*i)*a*b^4*d^5)*B^
2*x^4 - 2*(b^5*c^2*d^3*g^3*i - 10*(6*g^3*i*log(e) - g^3*i)*a*b^4*c*d^4 - (6
0*g^3*i*log(e) + 11*g^3*i)*a^2*b^3*d^5)*B^2*x^3 + 3*(b^5*c^3*d^2*g^3*i - 5*
a*b^4*c^2*d^3*g^3*i + 5*(12*g^3*i*log(e) - g^3*i)*a^2*b^3*c*d^4 + (20*g^3*i
*log(e) + 9*g^3*i)*a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4*d*g^3*i - 5*a*b^4*c^3*
d^2*g^3*i + 10*a^2*b^3*c^2*d^3*g^3*i - a^4*b*d^5*g^3*i - 5*(4*g^3*i*log(e)
+ g^3*i)*a^3*b^2*c*d^4)*B^2*x - (6*a*b^4*c^4*d*g^3*i - 27*a^2*b^3*c^3*d^2*g
^3*i + 47*a^3*b^2*c^2*d^3*g^3*i - (30*g^3*i*log(e) + 31*g^3*i)*a^4*b*c*d^4
+ (6*g^3*i*log(e) + 5*g^3*i)*a^5*d^5)*B^2)*log(b*x + a) - (24*B^2*b^5*d^5*g
^3*i*x^5*log(e) + 6*((5*g^3*i*log(e) - g^3*i)*b^5*c*d^4 + (15*g^3*i*log(e)
+ g^3*i)*a*b^4*d^5)*B^2*x^4 - 2*(b^5*c^2*d^3*g^3*i - 10*(6*g^3*i*log(e) - g
^3*i)*a*b^4*c*d^4 - (60*g^3*i*log(e) + 11*g^3*i)*a^2*b^3*d^5)*B^2*x^3 + 3*(
b^5*c^3*d^2*g^3*i - 5*a*b^4*c^2*d^3*g^3*i + 5*(12*g^3*i*log(e) - g^3*i)*a^2
*b^3*c*d^4 + (20*g^3*i*log(e) + 9*g^3*i)*a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4*
d*g^3*i - 5*a*b^4*c^3*d^2*g^3*i + 10*a^2*b^3*c^2*d^3*g^3*i - a^4*b*d^5*g^3*
i - 5*(4*g^3*i*log(e) + g^3*i)*a^3*b^2*c*d^4)*B^2*x + 6*(4*B^2*b^5*d^5*g^3*
i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3*i*x + 5*(b^5*c*d^4*g^3*i + 3*a*b^4*d^5*g^3
*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3*i + a^2*b^3*d^5*g^3*i)*B^2*x^3 + 10*(3*a^
2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*g^3*i)*B^2*x^2 + (5*a^4*b*c*d^4*g^3*i - a^5
*d^5*g^3*i)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3dg^3ix^4 + A^2a^3cg^3i + \left(A^2b^3c + 3\,A^2ab^2d\right)g^3ix^3 + 3\,\left(A^2ab^2c + A^2a^2bd\right)g^3ix^2 + \left(3\,A^2a^2bc + A^2a^3d\right)g^3ix\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] integral(A^2*b^3*d*g^3*i*x^4 + A^2*a^3*c*g^3*i + (A^2*b^3*c + 3*A^2*a*b^2*d
)*g^3*i*x^3 + 3*(A^2*a*b^2*c + A^2*a^2*b*d)*g^3*i*x^2 + (3*A^2*a^2*b*c + A^
2*a^3*d)*g^3*i*x + (B^2*b^3*d*g^3*i*x^4 + B^2*a^3*c*g^3*i + (B^2*b^3*c + 3*
B^2*a*b^2*d)*g^3*i*x^3 + 3*(B^2*a*b^2*c + B^2*a^2*b*d)*g^3*i*x^2 + (3*B^2*a
^2*b*c + B^2*a^3*d)*g^3*i*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*d*
g^3*i*x^4 + A*B*a^3*c*g^3*i + (A*B*b^3*c + 3*A*B*a*b^2*d)*g^3*i*x^3 + 3*(A*
B*a*b^2*c + A*B*a^2*b*d)*g^3*i*x^2 + (3*A*B*a^2*b*c + A*B*a^3*d)*g^3*i*x)*l
og((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 (dix + ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

3.56 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=450

$$\frac{B^2g^2i(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{6b^2d^3}+\frac{Bg^2i(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+3B\right)}{12b^2d^3}+\frac{Bg^2i(a+bx)(bc-ad)}{}$$

```
[Out] -(B^2*(b*c - a*d)^3*g^2*i*x)/(3*b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*(c + d*x)
^2)/(12*d^3) - (B*(b*c - a*d)^2*g^2*i*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*Log[(
e*(a + b*x))/(c + d*x)])^2)/(12*b^2) + (g^2*i*(a + b*x)^3*(c + d*x)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b) + (B*(b*c - a*d)^3*g^2*i*(a + b*x)*(
2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(12*b^2*d^2) + (B*(b*c - a*d)^
4*g^2*i*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))/(
c + d*x)]))/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*Log[c + d*x])/(6*b^2*d^
3) + (B^2*(b*c - a*d)^4*g^2*i*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(6*b
^2*d^3)
```

Rubi [A] time = 1.49015, antiderivative size = 537, normalized size of antiderivative = 1.19, number of steps used = 46, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^2i(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{6b^2d^3}-\frac{Bg^2i(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6b^2d^3}-\frac{Bg^2i(a+bx)^2(bc-ad)^2\left(B\log\right.}{12b^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (A*B*(b*c - a*d)^3*g^2*i*x)/(6*b*d^2) - (B^2*(b*c - a*d)^3*g^2*i*x)/(12*b*d
^2) + (B^2*(b*c - a*d)^2*g^2*i*(a + b*x)^2)/(12*b^2*d) + (B^2*(b*c - a*d)^3
*g^2*i*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(6*b^2*d^2) - (B*(b*c - a*d)
^2*g^2*i*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(12*b^2*d) - (B*
(b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b^2)
 + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
3*b^2) + (d*g^2*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b^
2) - (B^2*(b*c - a*d)^4*g^2*i*Log[c + d*x])/(12*b^2*d^3) + (B^2*(b*c - a*d)
^4*g^2*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(6*b^2*d^3) - (B*(
b*c - a*d)^4*g^2*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(6*b^
2*d^3) - (B^2*(b*c - a*d)^4*g^2*i*Log[c + d*x]^2)/(12*b^2*d^3) + (B^2*(b*c
- a*d)^4*g^2*i*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(6*b^2*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (56c+56dx)(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int\left(\frac{56(bc-ad)(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b}+\frac{56d(a\ldots}{\ldots}\right.$$

$$=\frac{(56(bc-ad))\int(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx}{b}+\frac{(56\ldots}{\ldots}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2}+\frac{14dg^2(a+\ldots}{\ldots}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2}+\frac{14dg^2(a+\ldots}{\ldots}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2}+\frac{14dg^2(a+\ldots}{\ldots}$$

$$=\frac{56(bc-ad)g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2}+\frac{14dg^2(a+\ldots}{\ldots}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B(bc-ad)^2g^2(a+bx)^2\left(A+B\log\ldots\right.}{3b^2d}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}+\frac{28B^2(bc-ad)^3g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\ldots\right.}{3b^2d^2}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}+\frac{28B^2(bc-ad)^3g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\ldots\right.}{3b^2d^2}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+\frac{14B^2(bc-ad)^2\ldots}{3b^2\ldots}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+\frac{14B^2(bc-ad)^2\ldots}{3b^2\ldots}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+\frac{14B^2(bc-ad)^2\ldots}{3b^2\ldots}$$

$$=\frac{28AB(bc-ad)^3g^2x}{3bd^2}-\frac{14B^2(bc-ad)^3g^2x}{3bd^2}+\frac{14B^2(bc-ad)^2\ldots}{3b^2\ldots}$$

Mathematica [A] time = 0.547115, size = 680, normalized size = 1.51

$$g^2i\left(\frac{4B(bc-ad)^2\left(B(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+\ldots}{c+\ldots}\right.\right.\right.}{d^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g^2*i*(4*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
3*d*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (4*B*(b*c - a*d)^2
```

```
*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c
+ d*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c -
 a*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
*Log[c + d*x] + B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + B*(b*
c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*
x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3 - (B*(b*c - a*d)*(6*A*b
*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d
)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c -
 a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[c + d
*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*
x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(12*b^2
)
```

Maple [F] time = 2.228, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2} \left(dix+ci\right) \left(A+B\ln \left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.83153, size = 3028, normalized size = 6.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] 1/4*A^2*b^2*d*g^2*i*x^4 + 1/3*A^2*b^2*c*g^2*i*x^3 + 2/3*A^2*a*b*d*g^2*i*x^3
 + A^2*a*b*c*g^2*i*x^2 + 1/2*A^2*a^2*d*g^2*i*x^2 + 2*(x*log(b*e*x/(d*x + c)
 + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^2*c*g^2*i +
2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*lo
g(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*b*c*g^2*i + 1/3*(2*x^3*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/
d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^
2*c*g^2*i + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^
2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*d*g^2*i + 2/3*(2*x^
3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log
(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^
2))*A*B*a*b*d*g^2*i + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*
a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*
x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A
*B*b^2*d*g^2*i + A^2*a^2*c*g^2*i*x - 1/12*(2*a^3*c*d^3*g^2*i + (2*g^2*i*log
(e) + g^2*i)*b^3*c^4 - 2*(4*g^2*i*log(e) + g^2*i)*a*b^2*c^3*d + (12*g^2*i*l
og(e) - g^2*i)*a^2*b*c^2*d^2)*B^2*log(d*x + c)/(b*d^3) - 1/6*(b^4*c^4*g^2*i
 - 4*a*b^3*c^3*d*g^2*i + 6*a^2*b^2*c^2*d^2*g^2*i - 4*a^3*b*c*d^3*g^2*i + a^
```

```
4*d^4*g^2*i)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d
*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^3) + 1/12*(3*B^2*b^4*d^4*g^2*i*x^4*log(e
)^2 + 2*((2*g^2*i*log(e)^2 - g^2*i*log(e))*b^4*c*d^3 + (4*g^2*i*log(e)^2 +
g^2*i*log(e))*a*b^3*d^4)*B^2*x^3 - ((g^2*i*log(e) - g^2*i)*b^4*c^2*d^2 - 2*
(6*g^2*i*log(e)^2 - 2*g^2*i*log(e) - g^2*i)*a*b^3*c*d^3 - (6*g^2*i*log(e)^2
 + 5*g^2*i*log(e) + g^2*i)*a^2*b^2*d^4)*B^2*x^2 + ((2*g^2*i*log(e) - g^2*i)
*b^4*c^3*d - (8*g^2*i*log(e) - 5*g^2*i)*a*b^3*c^2*d^2 + (12*g^2*i*log(e)^2
+ 4*g^2*i*log(e) - 7*g^2*i)*a^2*b^2*c*d^3 + (2*g^2*i*log(e) + 3*g^2*i)*a^3*
b*d^4)*B^2*x + (3*B^2*b^4*d^4*g^2*i*x^4 + 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*
(b^4*c*d^3*g^2*i + 2*a*b^3*d^4*g^2*i)*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^
2*b^2*d^4*g^2*i)*B^2*x^2 + (4*a^3*b*c*d^3*g^2*i - a^4*d^4*g^2*i)*B^2)*log(b
*x + a)^2 + (3*B^2*b^4*d^4*g^2*i*x^4 + 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*(b^
4*c*d^3*g^2*i + 2*a*b^3*d^4*g^2*i)*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^2*b
^2*d^4*g^2*i)*B^2*x^2 + (b^4*c^4*g^2*i - 4*a*b^3*c^3*d*g^2*i + 6*a^2*b^2*c^
2*d^2*g^2*i)*B^2)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g^2*i*x^4*log(e) + 2*((4*
g^2*i*log(e) - g^2*i)*b^4*c*d^3 + (8*g^2*i*log(e) + g^2*i)*a*b^3*d^4)*B^2*x
^3 - (b^4*c^2*d^2*g^2*i - 4*(6*g^2*i*log(e) - g^2*i)*a*b^3*c*d^3 - (12*g^2*
i*log(e) + 5*g^2*i)*a^2*b^2*d^4)*B^2*x^2 + 2*(b^4*c^3*d*g^2*i - 4*a*b^3*c^2
*d^2*g^2*i + a^3*b*d^4*g^2*i + 2*(6*g^2*i*log(e) + g^2*i)*a^2*b^2*c*d^3)*B^
2*x + (2*a*b^3*c^3*d*g^2*i - 7*a^2*b^2*c^2*d^2*g^2*i + 2*(4*g^2*i*log(e) +
3*g^2*i)*a^3*b*c*d^3 - (2*g^2*i*log(e) + g^2*i)*a^4*d^4)*B^2)*log(b*x + a)
- (6*B^2*b^4*d^4*g^2*i*x^4*log(e) + 2*((4*g^2*i*log(e) - g^2*i)*b^4*c*d^3 +
 (8*g^2*i*log(e) + g^2*i)*a*b^3*d^4)*B^2*x^3 - (b^4*c^2*d^2*g^2*i - 4*(6*g^
2*i*log(e) - g^2*i)*a*b^3*c*d^3 - (12*g^2*i*log(e) + 5*g^2*i)*a^2*b^2*d^4)*
B^2*x^2 + 2*(b^4*c^3*d*g^2*i - 4*a*b^3*c^2*d^2*g^2*i + a^3*b*d^4*g^2*i + 2*
(6*g^2*i*log(e) + g^2*i)*a^2*b^2*c*d^3)*B^2*x + 2*(3*B^2*b^4*d^4*g^2*i*x^4
+ 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*(b^4*c*d^3*g^2*i + 2*a*b^3*d^4*g^2*i)*B^
2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^2*b^2*d^4*g^2*i)*B^2*x^2 + (4*a^3*b*c*d^
3*g^2*i - a^4*d^4*g^2*i)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2dg^2ix^3 + A^2a^2cg^2i + \left(A^2b^2c + 2\,A^2abd\right)g^2ix^2 + \left(2\,A^2abc + A^2a^2d\right)g^2ix + \left(B^2b^2dg^2ix^3 + B^2a^2cg^2i + \left(B\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] integral(A^2*b^2*d*g^2*i*x^3 + A^2*a^2*c*g^2*i + (A^2*b^2*c + 2*A^2*a*b*d)*
g^2*i*x^2 + (2*A^2*a*b*c + A^2*a^2*d)*g^2*i*x + (B^2*b^2*d*g^2*i*x^3 + B^2*
a^2*c*g^2*i + (B^2*b^2*c + 2*B^2*a*b*d)*g^2*i*x^2 + (2*B^2*a*b*c + B^2*a^2*
d)*g^2*i*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^2*d*g^2*i*x^3 + A*B*a
^2*c*g^2*i + (A*B*b^2*c + 2*A*B*a*b*d)*g^2*i*x^2 + (2*A*B*a*b*c + A*B*a^2*d
)*g^2*i*x)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci) \left(B \log \left(\frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

3.57 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=343

$$-\frac{B^2gi(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^2d^2}-\frac{Bgi(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{3b^2d^2}-\frac{Bgi(a+bx)(bc-ad)^2\left(\right.}{3b^2d}$$

```
[Out] (B^2*(b*c - a*d)^2*g*i*x)/(3*b*d) - (B*(b*c - a*d)^2*g*i*(a + b*x)*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(3*b^2*d) - (B*(b*c - a*d)*g*i*(a + b*x)^2*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2) + ((b*c - a*d)*g*i*(a + b*x)^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*b^2) + (g*i*(a + b*x)^2*(c + d*x
)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b) - (B*(b*c - a*d)^3*g*i*Log[
(b*c - a*d)/(b*(c + d*x))]*(A + B + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2
*d^2) - (B^2*(b*c - a*d)^3*g*i*Log[c + d*x])/(3*b^2*d^2) - (B^2*(b*c - a*d)
^3*g*i*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b^2*d^2)
```

Rubi [B] time = 2.8165, antiderivative size = 1214, normalized size of antiderivative = 3.54, number of steps used = 78, number of rules used = 14, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 72}

$$-\frac{B^2dgi\log^2(a+bx)a^3}{3b^2}+\frac{2Bdgi\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)a^3}{3b^2}+\frac{2B^2dgi\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)a^3}{3b^2}+\frac{2B^2dgi\text{Po}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (-2*A*b*B*(a^2/b^2 - c^2/d^2)*d*g*i*x)/3 + (B^2*(b*c - a*d)^2*g*i*x)/(3*b*d
) - (A*B*(b*c - a*d)*(b*c + a*d)*g*i*x)/(b*d) + (a^2*B^2*(b*c - a*d)*g*i*Lo
g[a + b*x])/(3*b^2) - (a^2*B^2*c*g*i*Log[a + b*x]^2)/b - (a^3*B^2*d*g*i*Log
[a + b*x]^2)/(3*b^2) + (a^2*B^2*(b*c + a*d)*g*i*Log[a + b*x]^2)/(2*b^2) - (
B^2*(b*c - a*d)*(b*c + a*d)*g*i*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(3*
b^2*d) - (B*(b*c - a*d)*g*i*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/3 + (
2*a^2*B*c*g*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/b + (2*a^3
*B*d*g*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2) - (a^2*
B*(b*c + a*d)*g*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/b^2 +
a*c*g*i*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + ((b*c + a*d)*g*i*x^2*(A
+ B*Log[(e*(a + b*x))/(c + d*x)])^2)/2 + (b*d*g*i*x^3*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/3 - (B^2*c^2*(b*c - a*d)*g*i*Log[c + d*x])/(3*d^2) + (B^
2*(b*c - a*d)^2*(b*c + a*d)*g*i*Log[c + d*x])/(3*b^2*d^2) + (2*b*B^2*c^3*g*
i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*d^2) + (2*a*B^2*c^2*g*
i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (B^2*c^2*(b*c + a*d)*
g*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d^2 - (2*b*B*c^3*g*i*(A
 + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*d^2) - (2*a*B*c^2*g*i*(
A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/d + (B*c^2*(b*c + a*d)*g*
i*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/d^2 - (b*B^2*c^3*g*i*L
og[c + d*x]^2)/(3*d^2) - (a*B^2*c^2*g*i*Log[c + d*x]^2)/d + (B^2*c^2*(b*c +
 a*d)*g*i*Log[c + d*x]^2)/(2*d^2) + (2*a^2*B^2*c*g*i*Log[a + b*x]*Log[(b*(c
 + d*x))/(b*c - a*d)])/b + (2*a^3*B^2*d*g*i*Log[a + b*x]*Log[(b*(c + d*x))/
(b*c - a*d)])/(3*b^2) - (a^2*B^2*(b*c + a*d)*g*i*Log[a + b*x]*Log[(b*(c + d
*x))/(b*c - a*d)])/b^2 + (2*a^2*B^2*c*g*i*PolyLog[2, -((d*(a + b*x))/(b*c -
 a*d))])/b + (2*a^3*B^2*d*g*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*
b^2) - (a^2*B^2*(b*c + a*d)*g*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/b
```

```
^2 + (2*b*B^2*c^3*g*i*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*d^2) + (2*a
*B^2*c^2*g*i*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/d - (B^2*c^2*(b*c + a*d
)*g*i*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/d^2
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (57c+57dx)(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int\left(57acg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+57(bc+ad)gx\left(A+B\log\right.\right.$$

$$= (57acg)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx+(57bdg)\int x^2\left(A+B\right.$$

$$= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ad)gx^2\left(A+B\log\right.$$

$$= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ad)gx^2\left(A+B\log\right.$$

$$= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ad)gx^2\left(A+B\log\right.$$

$$= 57acgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{57}{2}(bc+ad)gx^2\left(A+B\log\right.$$

$$= -\frac{19AB(bc-ad)(bc+ad)gx}{bd}-19B(bc-ad)gx^2\left(A+B\log\left(\frac{e(a}{c}\right.\right.$$

$$= -\frac{19AB(bc-ad)(bc+ad)gx}{bd}-\frac{19B^2(bc-ad)(bc+ad)g(a+bx)}{b^2d}$$

$$= -\frac{19AB(bc-ad)(bc+ad)gx}{bd}-\frac{19B^2(bc-ad)(bc+ad)g(a+bx)}{b^2d}$$

$$= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)gx}{bd}+\frac{19a^2B^2(bc-}{}$$

$$= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)gx}{bd}+\frac{19a^2B^2(bc-}{}$$

$$= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)gx}{bd}+\frac{19a^2B^2(bc-}{}$$

$$= \frac{19B^2(bc-ad)^2gx}{bd}-\frac{19AB(bc-ad)(bc+ad)gx}{bd}+\frac{19a^2B^2(bc-}{}$$

Mathematica [B] time = 0.700155, size = 869, normalized size = 2.53

$$gi\left(2b^3B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)c^3-b^3B^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log(c+dx)+2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)\right)c\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^
2,x]
```

```
[Out] (g*i*(-6*A*b^2*B*c*d*(b*c - a*d)*x + 6*a*A*b*B*d^2*(-(b*c) + a*d)*x + 4*A*b
*B*d*(b*c - a*d)*(b*c + a*d)*x - 6*b*B^2*c*d*(b*c - a*d)*(a + b*x)*Log[(e*(
a + b*x))/(c + d*x)] + 6*a*B^2*d^2*(-(b*c) + a*d)*(a + b*x)*Log[(e*(a + b*x
))/(c + d*x)] + 4*B^2*d*(b*c - a*d)*(b*c + a*d)*(a + b*x)*Log[(e*(a + b*x))
```

```
/(c + d*x)] - 2*b^2*B*d^2*(b*c - a*d)*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)]) + 6*a^2*b*B*c*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2
*a^3*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*a*b^2*c*d^
2*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 3*b^2*d^2*(b*c + a*d)*x^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2 + 2*b^3*d^3*x^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2 + 6*b*B^2*c*(b*c - a*d)^2*Log[c + d*x] + 6*a*B^2*d*(b*c - a*
d)^2*Log[c + d*x] - 4*B^2*(b*c - a*d)^2*(b*c + a*d)*Log[c + d*x] + 2*b^3*B*
c^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 6*a*b^2*B*c^2*d*(A
+ B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*B^2*(b*c - a*d)*(a^2*d^2
*Log[a + b*x] - b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*a^2*b*B^2*
c*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + a^3*B^2*d^3*(Log[a + b*x]*(Log[a
 + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)]) - b^3*B^2*c^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*a*b^2*B
^2*c^2*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(6*b^2*d^2)
```

Maple [F] time = 2.007, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)(dix + ci)\left(A + B\ln\left(\frac{e\,(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.69641, size = 1690, normalized size = 4.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorit
hm="maxima")
```

```
[Out] 1/3*A^2*b*d*g*i*x^3 + 1/2*A^2*b*c*g*i*x^2 + 1/2*A^2*a*d*g*i*x^2 + 2*(x*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B
*a*c*g*i + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2
 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*b*c*g*i + (x^2*log(b*e*x
/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 -
 (b*c - a*d)*x/(b*d))*A*B*a*d*g*i + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d
*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*
b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b*d*g*i + A^2*a*c*g*i*
x + 1/3*(b^2*c^3*g*i*log(e) - a^2*c*d^2*g*i - (3*g*i*log(e) - g*i)*a*b*c^2*
d)*B^2*log(d*x + c)/(b*d^2) + 1/3*(b^3*c^3*g*i - 3*a*b^2*c^2*d*g*i + 3*a^2*
b*c*d^2*g*i - a^3*d^3*g*i)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1)
 + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/6*(2*B^2*b^3*d^3*g*
i*x^3*log(e)^2 + ((3*g*i*log(e)^2 - 2*g*i*log(e))*b^3*c*d^2 + (3*g*i*log(e)
^2 + 2*g*i*log(e))*a*b^2*d^3)*B^2*x^2 - 2*((g*i*log(e) - g*i)*b^3*c^2*d - (
3*g*i*log(e)^2 - 2*g*i)*a*b^2*c*d^2 - (g*i*log(e) + g*i)*a^2*b*d^3)*B^2*x +
 (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^
```

```
2*d^3*g*i)*B^2*x^2 + (3*a^2*b*c*d^2*g*i - a^3*d^3*g*i)*B^2)*log(b*x + a)^2
+ (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b
^2*d^3*g*i)*B^2*x^2 - (b^3*c^3*g*i - 3*a*b^2*c^2*d*g*i)*B^2)*log(d*x + c)^2
 + 2*(2*B^2*b^3*d^3*g*i*x^3*log(e) + ((3*g*i*log(e) - g*i)*b^3*c*d^2 + (3*g
*i*log(e) + g*i)*a*b^2*d^3)*B^2*x^2 + (6*a*b^2*c*d^2*g*i*log(e) - b^3*c^2*d
*g*i + a^2*b*d^3*g*i)*B^2*x - (a^3*d^3*g*i*log(e) + a*b^2*c^2*d*g*i - (3*g*
i*log(e) + g*i)*a^2*b*c*d^2)*B^2)*log(b*x + a) - 2*(2*B^2*b^3*d^3*g*i*x^3*l
og(e) + ((3*g*i*log(e) - g*i)*b^3*c*d^2 + (3*g*i*log(e) + g*i)*a*b^2*d^3)*B
^2*x^2 + (6*a*b^2*c*d^2*g*i*log(e) - b^3*c^2*d*g*i + a^2*b*d^3*g*i)*B^2*x +
 (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^
2*d^3*g*i)*B^2*x^2 + (3*a^2*b*c*d^2*g*i - a^3*d^3*g*i)*B^2)*log(b*x + a))*l
og(d*x + c))/(b^2*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bdgix^2 + A^2acgi + \left(A^2bc + A^2ad\right)gix + \left(B^2bdgix^2 + B^2acgi + \left(B^2bc + B^2ad\right)gix\right)\log\left(\frac{bex + ae}{dx + c}\right)^2 + 2\left(ABbc\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorit
hm="fricas")
```

```
[Out] integral(A^2*b*d*g*i*x^2 + A^2*a*c*g*i + (A^2*b*c + A^2*a*d)*g*i*x + (B^2*b
*d*g*i*x^2 + B^2*a*c*g*i + (B^2*b*c + B^2*a*d)*g*i*x)*log((b*e*x + a*e)/(d*
x + c))^2 + 2*(A*B*b*d*g*i*x^2 + A*B*a*c*g*i + (A*B*b*c + A*B*a*d)*g*i*x)*l
og((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)(dix + ci)\left(B\log\left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorit
hm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2,
 x)
```

3.58 $\int (ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=203

$$-\frac{B^2i(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2d}+\frac{Bi(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2d}-\frac{Bi(a+bx)(bc-ad)\left(B\log\right.}{b^2}$$

```
[Out] -((B*(b*c - a*d)*i*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/b^2) + (
i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d) + (B^2*(b*c - a
*d)^2*i*Log[c + d*x])/(b^2*d) + (B*(b*c - a*d)^2*i*(A + B*Log[(e*(a + b*x))
/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*d) - (B^2*(b*c - a*
d)^2*i*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*d)
```

Rubi [A] time = 0.432791, antiderivative size = 283, normalized size of antiderivative = 1.39, number of steps used = 16, number of rules used = 12, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2i(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2d}-\frac{Bi(bc-ad)^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2d}+\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*i*x)/b) + (B^2*(b*c - a*d)^2*i*Log[a + b*x]^2)/(2*b^2*d)
 - (B^2*(b*c - a*d)*i*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/b^2 - (B*(b*c
 - a*d)^2*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*d) + (i
*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d) + (B^2*(b*c - a*
d)^2*i*Log[c + d*x])/(b^2*d) - (B^2*(b*c - a*d)^2*i*Log[a + b*x]*Log[(b*(c
+ d*x))/(b*c - a*d)])/(b^2*d) - (B^2*(b*c - a*d)^2*i*PolyLog[2, -((d*(a + b
*x))/(b*c - a*d))])/(b^2*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (58c+58dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - \frac{B\int \frac{3364(bc-ad)(c+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx}}{58d}$$

$$= \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - \frac{(58B(bc-ad))\int \frac{(c+dx)\left(A+B\log\left(\frac{e(a\cdots}{c+\cdots}\right.\right.}{a+bx}}{d}$$

$$= \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - \frac{(58B(bc-ad))\int\left(\frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\cdots\right.}{b}\right.}{d}$$

$$= \frac{29(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} - \frac{(58B(bc-ad))\int\left(A+B\log\left(\frac{e(a+\cdots}{c+\cdots}\right.\right.}{b}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B(bc-ad)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2d} + \cdots$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2} - \frac{58B(bc-a\cdots}{\cdots}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2} - \frac{58B(bc-a\cdots}{\cdots}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2} - \frac{58B(bc-a\cdots}{\cdots}$$

$$= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2} - \frac{58B(bc-a\cdots}{\cdots}$$

$$= -\frac{58AB(bc-ad)x}{b} + \frac{29B^2(bc-ad)^2\log^2(a+bx)}{b^2d} - \frac{58B^2(bc-ad)(a+\cdots}{b^2\cdots}$$

$$= -\frac{58AB(bc-ad)x}{b} + \frac{29B^2(bc-ad)^2\log^2(a+bx)}{b^2d} - \frac{58B^2(bc-ad)(a+\cdots}{b^2\cdots}$$

Mathematica [A] time = 0.207744, size = 205, normalized size = 1.01

$$\frac{i\left((c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B(bc-ad)\left(2B(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)+2\left(Bd(a+\cdots\right.\right.}{b^2}\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i*((c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*((-
(b*B*c) + a*B*d)*Log[a + b*x]^2 + 2*(A*b*d*x + B*d*(a + b*x)*Log[(e*(a + b*
x))/(c + d*x)] + (-(b*B*c) + a*B*d)*Log[c + d*x]) + 2*(b*c - a*d)*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)] + B*Log[(b*(c + d*x))/(b*c - a*d)])
 + 2*B*(b*c - a*d)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/b^2))/(2*d)
```

Maple [F] time = 1.796, size = 0, normalized size = 0.

$$\int (dix+ci)\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.6418, size = 855, normalized size = 4.21

$$\frac{1}{2}A^2dix^2 + 2\left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)ABci + \left(x^2\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) - \frac{a^2\log(bx+}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*d*i*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a
)/b - c*log(d*x + c)/d)*A*B*c*i + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*d
*i + A^2*c*i*x - ((i*log(e) - i)*b*c^2 + a*c*d*i)*B^2*log(d*x + c)/(b*d) -
(b^2*c^2*i - 2*a*b*c*d*i + a^2*d^2*i)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
- a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d) + 1/2*(B^2*b^2
*d^2*i*x^2*log(e)^2 + 2*(a*b*d^2*i*log(e) + (i*log(e)^2 - i*log(e))*b^2*c*d
)*B^2*x + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + (2*a*b*c*d*i - a^2*d^2*i
)*B^2)*log(b*x + a)^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + B^2*b^2*c^
2*i)*log(d*x + c)^2 + 2*(B^2*b^2*d^2*i*x^2*log(e) + ((2*i*log(e) - i)*b^2*c
*d + a*b*d^2*i)*B^2*x + ((2*i*log(e) - i)*a*b*c*d - (i*log(e) - i)*a^2*d^2)
*B^2)*log(b*x + a) - 2*(B^2*b^2*d^2*i*x^2*log(e) + ((2*i*log(e) - i)*b^2*c*
d + a*b*d^2*i)*B^2*x + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + (2*a*b*c*d*
i - a^2*d^2*i)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2dix + A^2ci + \left(B^2dix + B^2ci\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABdix + ABci\right)\log\left(\frac{bex+ae}{dx+c}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*d*i*x + A^2*c*i + (B^2*d*i*x + B^2*c*i)*log((b*e*x + a*e)/(d*x
 + c))^2 + 2*(A*B*d*i*x + A*B*c*i)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.59 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=286

$$\frac{2Bi(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g}+\frac{2B^2i(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2g}+\frac{2B^2i(bc-ad)\text{PolyLog}\left(3,\right.}{b^2g}$$

```
[Out] (2*B*(b*c - a*d)*i*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(b^2*g) + (d*i*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^
2)/(b^2*g) - ((b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 -
(b*(c + d*x))/(d*(a + b*x))])/(b^2*g) + (2*B^2*(b*c - a*d)*i*PolyLog[2, (d*
(a + b*x))/(b*(c + d*x))])/(b^2*g) + (2*B*(b*c - a*d)*i*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g) + (2*B^2
*(b*c - a*d)*i*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g)
```

Rubi [B] time = 2.93939, antiderivative size = 644, normalized size of antiderivative = 2.25, number of steps used = 39, number of rules used = 19, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.475, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABi(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}+\frac{2B^2i(bc-ad)\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g}+\frac{2aB^2di\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right.}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x),x]
```

```
[Out] -((a*B^2*d*i*Log[a + b*x]^2)/(b^2*g)) - (A*B*(b*c - a*d)*i*Log[a + b*x]^2)/
(b^2*g) - (B^2*(b*c - a*d)*i*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a +
b*x))/(c + d*x)]^2)/(b^2*g) - (B^2*(b*c - a*d)*i*Log[a + b*x]*Log[(e*(a + b
*x))/(c + d*x)]^2)/(b^2*g) + (2*a*B*d*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(b^2*g) + (d*i*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b
*g) + ((b*c - a*d)*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
b^2*g) + (2*B^2*c*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*g) -
 (2*B*c*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b*g) - (B^2*c
*i*Log[c + d*x]^2)/(b*g) + (2*a*B^2*d*i*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
 - a*d)])/(b^2*g) + (2*A*B*(b*c - a*d)*i*Log[a + b*x]*Log[(b*(c + d*x))/(b*
c - a*d)])/(b^2*g) + (2*a*B^2*d*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])
/(b^2*g) + (2*A*B*(b*c - a*d)*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(
b^2*g) + (2*B^2*c*i*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*g) + (2*B^2*(
b*c - a*d)*i*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a
+ b*x))])/(b^2*g) + (2*B^2*(b*c - a*d)*i*PolyLog[3, 1 + (b*c - a*d)/(d*(a +
 b*x))])/(b^2*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(59c+59dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{59d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg}+\frac{59(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg(a+bx)}\right)dx$$

$$= \frac{(59d)\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{bg}+\frac{(59(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{bg}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg}+\frac{59(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg}+\frac{59(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg}+\frac{59(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g}$$

$$= \frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg}+\frac{59(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g}$$

$$= \frac{118aBd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g}+\frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg} -$$

$$= \frac{118aBd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g}+\frac{59dx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg} -$$

$$= -\frac{59B^2(bc-ad)\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g}+\frac{118aBd\log(a+bx)\left(A+B\,\mathrm{lo}\right.}{b^2g}$$

$$= -\frac{59B^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g}-\frac{59B^2(bc-ad)\log(a+bx)}{b^2g}$$

$$= -\frac{59AB(bc-ad)\log^2(a+bx)}{b^2g}-\frac{59B^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right.}{b^2g}$$

$$= -\frac{59aB^2d\log^2(a+bx)}{b^2g}-\frac{59AB(bc-ad)\log^2(a+bx)}{b^2g}-\frac{59B^2(bc-ad)\log}{}$$

$$= -\frac{59aB^2d\log^2(a+bx)}{b^2g}-\frac{59AB(bc-ad)\log^2(a+bx)}{b^2g}-\frac{59B^2(bc-ad)\log}{}$$

Mathematica [B] time = 1.31181, size = 987, normalized size = 3.45

$$\frac{i\left(3bdxA^2+3(bc-ad)\log(a+bx)A^2-3B\left(ad\log^2\left(\frac{a}{b}+x\right)-2ad(\log(a+bx)+1)\log\left(\frac{a}{b}+x\right)+2\left(-bc+ad+\log\left(\frac{c}{d}+\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x),x]
```

```
[Out] (i*(3*A^2*b*d*x + 3*A^2*(b*c - a*d)*Log[a + b*x] - 3*A*B*(a*d*Log[a/b + x]^
2 - 2*a*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*
(b*c + a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x
) + a*d*Log[a + b*x])*Log[(e*(a + b*x))/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)]) + 3*A*b*B*c*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a
/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)]) - 2*(Log[c/d + x]*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) -
 B^2*(a*d*Log[a/b + x]^3 - 3*d*(2*b*x - 2*(a + b*x)*Log[a/b + x] + (a + b*x
)*Log[a/b + x]^2) - 3*b*(2*d*x - 2*(c + d*x)*Log[c/d + x] + (c + d*x)*Log[c
/d + x]^2) - 3*d*(b*x - a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log
[(e*(a + b*x))/(c + d*x)])^2 + 6*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*
Log[c + d*x] + Log[a/b + x]*(-(d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b
*c - a*d)*Log[(b*(c + d*x))/(b*c - a*d)]) + (b*c - a*d)*PolyLog[2, (d*(a +
b*x))/(-(b*c) + a*d)]) - 3*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))
/(c + d*x)])*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a/b + x] + a*d*Log[a/b + x
]^2 + 2*Log[c/d + x]*(b*(c + d*x) - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)])
- 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 3*a*d*(Log[a/b + x]^2*(Log
[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)]) +
3*a*d*(Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[c/d + x]*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d
)])) - 3*b*B^2*c*(Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))/(c +
d*x)]^2 - 2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b
*x))] - 2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])))/(3*b^2*g)
```

Maple [F] time = 2.77, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{bgx+ag}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^2di\left(\frac{x}{bg}-\frac{a\log(bx+a)}{b^2g}\right)+\frac{A^2ci\log(bgx+ag)}{bg}+\frac{\left(B^2bdix+(bci-adi)B^2\log(bx+a)\right)\log(dx+c)^2}{b^2g}-\int -\frac{B^2b^2c^2i\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorit
hm="maxima")
```

```
[Out] A^2*d*i*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + A^2*c*i*log(b*g*x + a*g)/(b*g)
 + (B^2*b*d*i*x + (b*c*i - a*d*i)*B^2*log(b*x + a))*log(d*x + c)^2/(b^2*g)
- integrate(-(B^2*b^2*c^2*i*log(e)^2 + 2*A*B*b^2*c^2*i*log(e) + (B^2*b^2*d^
2*i*log(e)^2 + 2*A*B*b^2*d^2*i*log(e))*x^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2
*c*d*i*x + B^2*b^2*c^2*i)*log(b*x + a)^2 + 2*(B^2*b^2*c*d*i*log(e)^2 + 2*A*
B*b^2*c*d*i*log(e))*x + 2*(B^2*b^2*c^2*i*log(e) + A*B*b^2*c^2*i + (B^2*b^2*
d^2*i*log(e) + A*B*b^2*d^2*i)*x^2 + 2*(B^2*b^2*c*d*i*log(e) + A*B*b^2*c*d*i
)*x)*log(b*x + a) - 2*(B^2*b^2*c^2*i*log(e) + A*B*b^2*c^2*i + ((i*log(e) +
i)*B^2*b^2*d^2 + A*B*b^2*d^2*i)*x^2 + (2*A*B*b^2*c*d*i + (2*b^2*c*d*i*log(e
) + a*b*d^2*i)*B^2)*x + (B^2*b^2*d^2*i*x^2 + (3*b^2*c*d*i - a*b*d^2*i)*B^2*
x + (b^2*c^2*i + a*b*c*d*i - a^2*d^2*i)*B^2)*log(b*x + a))*log(d*x + c))/(b
^3*d*g*x^2 + a*b^2*c*g + (b^3*c*g + a*b^2*d*g)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2dix + A^2ci + \left(B^2dix + B^2ci\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABdix + ABci\right)\log\left(\frac{bex+ae}{dx+c}\right)}{bgx + ag}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorit
hm="fricas")
```

```
[Out] integral((A^2*d*i*x + A^2*c*i + (B^2*d*i*x + B^2*c*i)*log((b*e*x + a*e)/(d*
x + c))^2 + 2*(A*B*d*i*x + A*B*c*i)*log((b*e*x + a*e)/(d*x + c)))/(b*g*x +
a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{bgx + ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorit
hm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g),
 x)
```

3.60 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=241

$$\frac{2BdiPolyLog\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^2}+\frac{2B^2diPolyLog\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}-\frac{di\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right.}{b^2g^2}$$

```
[Out] (-2*B^2*i*(c + d*x))/(b*g^2*(a + b*x)) - (2*B*i*(c + d*x)*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(b*g^2*(a + b*x)) - (i*(c + d*x)*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B*d*i*(A + B*L
og[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*
g^2) + (2*B^2*d*i*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2)
```

Rubi [B] time = 3.02775, antiderivative size = 705, normalized size of antiderivative = 2.93, number of steps used = 43, number of rules used = 20, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABdiPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2}+\frac{2B^2diPolyLog\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g^2}-\frac{2B^2diPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2}-\frac{2B^2diPo}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^2,
x]
```

```
[Out] (-2*B^2*(b*c - a*d)*i)/(b^2*g^2*(a + b*x)) - (2*B^2*d*i*Log[a + b*x])/(b^2*
g^2) - (A*B*d*i*Log[a + b*x]^2)/(b^2*g^2) + (B^2*d*i*Log[a + b*x]^2)/(b^2*g
^2) - (B^2*d*i*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x
)]^2)/(b^2*g^2) - (B^2*d*i*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^
2*g^2) - (2*B*(b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g^2*
(a + b*x)) - (2*B*d*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b
^2*g^2) - ((b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^2*g^2*(
a + b*x)) + (d*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^2*
g^2) + (2*B^2*d*i*Log[c + d*x])/(b^2*g^2) - (2*B^2*d*i*Log[-((d*(a + b*x))/
(b*c - a*d))]*Log[c + d*x])/(b^2*g^2) + (2*B*d*i*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x])/(b^2*g^2) + (B^2*d*i*Log[c + d*x]^2)/(b^2*g^2) + (
2*A*B*d*i*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) - (2*B^2*d
*i*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) + (2*A*B*d*i*Poly
Log[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*g^2) - (2*B^2*d*i*PolyLog[2, -((
d*(a + b*x))/(b*c - a*d))])/(b^2*g^2) - (2*B^2*d*i*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/(b^2*g^2) + (2*B^2*d*i*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[
2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*g^2) + (2*B^2*d*i*PolyLog[3, 1 + (b
*c - a*d)/(d*(a + b*x))])/(b^2*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
```

```
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(60c+60dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)^2} + \frac{60d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)}\right)dx$$

$$= \frac{(60d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{bg^2} + \frac{(60(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{bg^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g^2}$$

$$= -\frac{60(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2(a+bx)} + \frac{60d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^2g^2}$$

$$= -\frac{120B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} - \frac{120Bd\log(a+bx)\left(A+B\log\left(\frac{e(\cdots}{\cdots}\right.\right.}{b^2g^2}$$

$$= -\frac{120B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)} - \frac{120Bd\log(a+bx)\left(A+B\log\left(\frac{e(\cdots}{\cdots}\right.\right.}{b^2g^2}$$

$$= -\frac{60B^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g^2} - \frac{120B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^2(a+bx)}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+\cdots}{c+\cdots}\right.}{b^2g^2}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60ABd\log^2(a+bx)}{b^2g^2} - \frac{60B^2d\,\mathrm{l}\cdots}{}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60ABd\log^2(a+bx)}{b^2g^2} + \frac{60B^2d\,\mathrm{l}\cdots}{}$$

$$= -\frac{120B^2(bc-ad)}{b^2g^2(a+bx)} - \frac{120B^2d\log(a+bx)}{b^2g^2} - \frac{60ABd\log^2(a+bx)}{b^2g^2} + \frac{60B^2d\,\mathrm{l}\cdots}{}$$

Mathematica [B] time = 2.46368, size = 1407, normalized size = 5.84

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^2,x]
```

```
[Out] (i*((3*A^2*(-(b*c) + a*d))/(a + b*x) + 3*A^2*d*Log[a + b*x] - (6*A*b*B*c*(-
(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c) + a*d)]
+ (b*c - a*d)*(1 + Log[(e*(a + b*x))/(c + d*x)])))/((b*c - a*d)*(a + b*x))
+ (3*b*B^2*c*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(b*c - a*d)*L
og[(e*(a + b*x))/(c + d*x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(e*(a + b*x))/
(c + d*x)] - (b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*d*(a + b*x)*Log
[c + d*x] - 2*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c
 + b*d*x)] + d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/
(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(
Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(
b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b
*c - a*d)*(a + b*x)) + 3*A*B*d*(Log[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x
] - 2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[a + b*x]*((a*d
)/(b*c - a*d) + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)]) + 2*a*((a + b*
x)^(-1) + Log[(e*(a + b*x))/(c + d*x)]/(a + b*x) + (d*Log[c + d*x])/(-(b*c)
 + a*d)) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + (B^2*d*((b*c - a*d)*(
a + b*x)*Log[a/b + x]^3 + 3*a*(b*c - a*d)*(2 + 2*Log[a/b + x] + Log[a/b + x
]^2) + 3*(b*c - a*d)*(a + (a + b*x)*Log[a + b*x])*(-Log[a/b + x] + Log[c/d
+ x] + Log[(e*(a + b*x))/(c + d*x)])^2 + 3*a*(d*(a + b*x)*Log[a/b + x]^2 +
2*((-(b*c) + a*d)*Log[c/d + x] + d*(a + b*x)*(Log[a + b*x] - Log[c + d*x]))
 - 2*Log[a/b + x]*((b*c - a*d)*Log[c/d + x] + d*(a + b*x)*Log[(b*(c + d*x))
/(b*c - a*d)]) - 2*d*(a + b*x)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) +
3*a*(Log[c/d + x]*(b*(c + d*x)*Log[c/d + x] - 2*d*(a + b*x)*Log[(d*(a + b*x
))/(-(b*c) + a*d)]) - 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
- 3*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*((b*c - a*
d)*(a + b*x)*Log[a/b + x]^2 + 2*a*(b*c - a*d)*(1 + Log[a/b + x]) + 2*a*(-(b
*c) + a*d)*Log[c/d + x] + 2*a*d*(a + b*x)*(Log[a + b*x] - Log[c + d*x]) - 2
*(b*c - a*d)*(a + b*x)*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])) - 3*(b*c - a*d)*(a + b*x)*(Log[a/b +
x]^2*(Log[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*PolyL
og[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) +
a*d)]) + 3*(b*c - a*d)*(a + b*x)*(Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[
3, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x))))/(3*b^2*g^2)
```

Maple [F] time = 3.008, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^2}\left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^2di\left(\frac{a}{b^3g^2x + ab^2g^2} + \frac{\log(bx + a)}{b^2g^2}\right) - 2\,ABci\left(\frac{\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)}{b^2g^2x + abg^2} + \frac{1}{b^2g^2x + abg^2} + \frac{d\log(bx + a)}{\left(b^2c - abd\right)g^2} - \frac{d\log(dx + c)}{\left(b^2c - abd\right)g^2}\right) - \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algor
ithm="maxima")
```

```
[Out] A^2*d*i*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - 2*A*B*c*i*(l
og(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x +
a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c -
a*b*d)*g^2)) - A^2*c*i/(b^2*g^2*x + a*b*g^2) - ((b*c*i - a*d*i)*B^2 - (B^2*
b*d*i*x + B^2*a*d*i)*log(b*x + a))*log(d*x + c)^2/(b^3*g^2*x + a*b^2*g^2) -
 integrate(-(B^2*b^2*c^2*i*log(e)^2 + (B^2*b^2*d^2*i*log(e)^2 + 2*A*B*b^2*d
^2*i*log(e))*x^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + B^2*b^2*c^2*i)*
log(b*x + a)^2 + 2*(B^2*b^2*c*d*i*log(e)^2 + A*B*b^2*c*d*i*log(e))*x + 2*(B
^2*b^2*c^2*i*log(e) + (B^2*b^2*d^2*i*log(e) + A*B*b^2*d^2*i)*x^2 + (2*B^2*b
^2*c*d*i*log(e) + A*B*b^2*c*d*i)*x)*log(b*x + a) - 2*((b^2*c^2*i*log(e) - a
*b*c*d*i + a^2*d^2*i)*B^2 + (B^2*b^2*d^2*i*log(e) + A*B*b^2*d^2*i)*x^2 + (A
*B*b^2*c*d*i + ((2*i*log(e) - i)*b^2*c*d + a*b*d^2*i)*B^2)*x + (2*B^2*b^2*d
^2*i*x^2 + 2*(b^2*c*d*i + a*b*d^2*i)*B^2*x + (b^2*c^2*i + a^2*d^2*i)*B^2)*l
og(b*x + a))*log(d*x + c))/(b^4*d*g^2*x^3 + a^2*b^2*c*g^2 + (b^4*c*g^2 + 2*
a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2 + a^2*b^2*d*g^2)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2dix + A^2ci + \left(B^2dix + B^2ci\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\,(ABdix + ABci)\log\left(\frac{bex+ae}{dx+c}\right)}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algor
ithm="fricas")
```

```
[Out] integral((A^2*d*i*x + A^2*c*i + (B^2*d*i*x + B^2*c*i)*log((b*e*x + a*e)/(d*
x + c))^2 + 2*(A*B*d*i*x + A*B*c*i)*log((b*e*x + a*e)/(d*x + c)))/(b^2*g^2*
x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{\left(bgx + ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^
2, x)
```

3.61 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=141

$$-\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)}-\frac{Bi(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)}-\frac{B^2i(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

```
[Out] -(B^2*i*(c + d*x)^2)/(4*(b*c - a*d)*g^3*(a + b*x)^2) - (B*i*(c + d*x)^2*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)*g^3*(a + b*x)^2) - (i*(c
+ d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)*g^3*(a + b*
x)^2)
```

Rubi [C] time = 1.94, antiderivative size = 639, normalized size of antiderivative = 4.53, number of steps used = 58, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2d^2i\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^3(bc-ad)}-\frac{B^2d^2i\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{b^2g^3(bc-ad)}-\frac{Bd^2i\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^3(bc-ad)}+\frac{Bd^2i\log(c+dx)}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^3,
x]
```

```
[Out] -(B^2*(b*c - a*d)*i)/(4*b^2*g^3*(a + b*x)^2) - (B^2*d*i)/(2*b^2*g^3*(a + b*
x)) - (B^2*d^2*i*Log[a + b*x])/(2*b^2*(b*c - a*d)*g^3) + (B^2*d^2*i*Log[a +
 b*x]^2)/(2*b^2*(b*c - a*d)*g^3) - (B*(b*c - a*d)*i*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(2*b^2*g^3*(a + b*x)^2) - (B*d*i*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(b^2*g^3*(a + b*x)) - (B*d^2*i*Log[a + b*x]*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(b^2*(b*c - a*d)*g^3) - ((b*c - a*d)*i*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(2*b^2*g^3*(a + b*x)^2) - (d*i*(A + B*Log[(e*(a + b*x
))/(c + d*x)])^2)/(b^2*g^3*(a + b*x)) + (B^2*d^2*i*Log[c + d*x])/(2*b^2*(b*
c - a*d)*g^3) - (B^2*d^2*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/
(b^2*(b*c - a*d)*g^3) + (B*d^2*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
 + d*x])/(b^2*(b*c - a*d)*g^3) + (B^2*d^2*i*Log[c + d*x]^2)/(2*b^2*(b*c - a
*d)*g^3) - (B^2*d^2*i*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*(b*
c - a*d)*g^3) - (B^2*d^2*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*(
b*c - a*d)*g^3) - (B^2*d^2*i*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*(b
*c - a*d)*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(61c+61dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = \int \left(\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^3(a+bx)^3}+\frac{61d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^3(a+bx)^2}\right)dx$$

$$= \frac{(61d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{bg^3}+\frac{(61(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}\,dx}{bg^3}$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{61d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^3(a+bx)}+(122B\cdots$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{61d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^3(a+bx)}+(122B\cdots$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{61d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^3(a+bx)}+(122B\cdots$$

$$= -\frac{61(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{61d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^3(a+bx)}-(61B\cdots$$

$$= -\frac{61B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2}-\frac{61Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)}-61B\cdots$$

$$= -\frac{61B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2}-\frac{61Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)}-61B\cdots$$

$$= -\frac{61B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^3(a+bx)^2}-\frac{61Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g^3(a+bx)}-61B\cdots$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2}-\frac{61B^2d}{2b^2g^3(a+bx)}-\frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3}-\frac{61B(bc-ad)\left(\cdots\right.}{2b^2g^3\cdots}$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2}-\frac{61B^2d}{2b^2g^3(a+bx)}-\frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3}-\frac{61B(bc-ad)\left(\cdots\right.}{2b^2g^3\cdots}$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2}-\frac{61B^2d}{2b^2g^3(a+bx)}-\frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3}+\frac{61B^2d^2\log^2(a\cdots}{2b^2(bc-ad\cdots}$$

$$= -\frac{61B^2(bc-ad)}{4b^2g^3(a+bx)^2}-\frac{61B^2d}{2b^2g^3(a+bx)}-\frac{61B^2d^2\log(a+bx)}{2b^2(bc-ad)g^3}+\frac{61B^2d^2\log^2(a\cdots}{2b^2(bc-ad\cdots}$$

Mathematica [C] time = 0.930415, size = 765, normalized size = 5.43

$$-\frac{i\left(B\left(2Bd^2(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-2Bd^2(a+bx)^2\left(2\text{PolyLog}\cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^3,x]
```

```
[Out] -(i*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 4*d*(-(b*c) +
 a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 4*B*d*(a + b*x)*(2
*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d*(a + b*x)*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(a + b*x)*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b*x]
 - d*(a + b*x)*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] -
2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*
d)]) + B*d*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*
Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B*(2*(b*c - a*d)
^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b
*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a
+ b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) +
 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
 - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*(a + b*x)
^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*P
olyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(4*b^2*(b*c - a*d)*g^3*(a + b*x)^2
)
```

Maple [B] time = 0.053, size = 865, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

```
[Out] 1/2*e^2*d*i/(a*d-b*c)^2/g^3*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2
*e^2*i/(a*d-b*c)^2/g^3*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c+e^2*d*
i/(a*d-b*c)^2/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*a-e^2*i/(a*d-b*c)^2/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/2*e^2*d*i/(a*d-b*c)^2/g^3*A*B
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2*e^2*i/(a*d-b*c)^2/g^3*A*B/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c+1/2*e^2*d*i/(a*d-b*c)^2/g^3*B^2/(b*e/
d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*e^
2*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2*b*c+1/2*e^2*d*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^2*i/(a*d-b*c)^2
/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*b*c+1/4*e^2*d*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^2*a-1/4*e^2*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*
c
```

Maxima [B] time = 1.76029, size = 2682, normalized size = 19.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algor
ithm="maxima")
```

```
[Out] -1/2*(2*b*x + a)*B^2*d*i*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^4*g^3*x^
2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + 1/4*(2*((2*b*d*x - b*c + 3*a*d)/((b^4*c
- a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*
g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2
*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3))*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - (b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*
a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^
2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x
+ a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b
^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^
2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3
+ a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2
*g^3)*x))*B^2*c*i - 1/4*(2*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5
*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^
2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*
b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d +
a^2*b^2*d^2)*g^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (7*a*b^2*c^2 - 8*
a^2*b*c*d + a^3*d^2 - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^
2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a)^2 - 2*(2*a^2*b*c*d - a^3*d^
2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(d*x +
c)^2 + 2*(4*b^3*c^2 - 5*a*b^2*c*d + a^2*b*d^2)*x + 2*(4*a^2*b*c*d - a^3*d^2
 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a
) - 2*(4*a^2*b*c*d - a^3*d^2 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d
 - a^2*b*d^2)*x - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 +
2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a))*log(d*x + c))/(a^2*b^4*c^2*g^3
 - 2*a^3*b^3*c*d*g^3 + a^4*b^2*d^2*g^3 + (b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 + a
^2*b^4*d^2*g^3)*x^2 + 2*(a*b^5*c^2*g^3 - 2*a^2*b^4*c*d*g^3 + a^3*b^3*d^2*g^
3)*x))*B^2*d*i - 1/2*A*B*d*i*(2*(2*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x
+ c))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2
*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3
*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*
c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((
b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)) + 1/2*A*B*c*i*((2*b*d*x - b*c +
3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^
2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 +
 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d +
a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g
^3)) - 1/2*B^2*c*i*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^3*g^3*x^2 + 2*
a*b^2*g^3*x + a^2*b*g^3) - 1/2*(2*b*x + a)*A^2*d*i/(b^4*g^3*x^2 + 2*a*b^3*g
^3*x + a^2*b^2*g^3) - 1/2*A^2*c*i/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] time = 0.525851, size = 602, normalized size = 4.27

$$-\frac{2\left(\left(2A^2+2AB+B^2\right)b^2cd-\left(2A^2+2AB+B^2\right)abd^2\right)ix+2\left(B^2b^2d^2ix^2+2B^2b^2cdix+B^2b^2c^2i\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+\left(\left(2\cdots\right)\right)}{4\left(\left(b^5c-ab^4d\right)g^3x^2+2\cdots\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algor
ithm="fricas")
```

```
[Out] -1/4*(2*((2*A^2 + 2*A*B + B^2)*b^2*c*d - (2*A^2 + 2*A*B + B^2)*a*b*d^2)*i*x
 + 2*(B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + B^2*b^2*c^2*i)*log((b*e*x + a
```

```
*e)/(d*x + c))^2 + ((2*A^2 + 2*A*B + B^2)*b^2*c^2 - (2*A^2 + 2*A*B + B^2)*a
^2*d^2)*i + 2*((2*A*B + B^2)*b^2*d^2*i*x^2 + 2*(2*A*B + B^2)*b^2*c*d*i*x +
(2*A*B + B^2)*b^2*c^2*i)*log((b*e*x + a*e)/(d*x + c)))/((b^5*c - a*b^4*d)*g
^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3)
```

Sympy [B] time = 13.8162, size = 712, normalized size = 5.05

$$-\frac{Bd^2 i\left(2A+B\right)\log\left(x+\frac{2ABad^3i+2ABbcd^2i+B^2ad^3i+B^2bcd^2i-\frac{Ba^2d^4i(2A+B)}{ad-bc}+\frac{2Babcd^3i(2A+B)}{ad-bc}-\frac{Bb^2c^2d^2i(2A+B)}{ad-bc}}{4ABbd^3i+2B^2bd^3i}\right)}{2b^2g^3\left(ad-bc\right)}+\frac{Bd^2 i\left(2A+B\right)\log\left(x+\frac{2ABa}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] -B*d**2*i*(2*A + B)*log(x + (2*A*B*a*d**3*i + 2*A*B*b*c*d**2*i + B**2*a*d**
3*i + B**2*b*c*d**2*i - B*a**2*d**4*i*(2*A + B)/(a*d - b*c) + 2*B*a*b*c*d**
3*i*(2*A + B)/(a*d - b*c) - B*b**2*c**2*d**2*i*(2*A + B)/(a*d - b*c))/(4*A*
B*b*d**3*i + 2*B**2*b*d**3*i))/(2*b**2*g**3*(a*d - b*c)) + B*d**2*i*(2*A +
B)*log(x + (2*A*B*a*d**3*i + 2*A*B*b*c*d**2*i + B**2*a*d**3*i + B**2*b*c*d*
*2*i + B*a**2*d**4*i*(2*A + B)/(a*d - b*c) - 2*B*a*b*c*d**3*i*(2*A + B)/(a*
d - b*c) + B*b**2*c**2*d**2*i*(2*A + B)/(a*d - b*c))/(4*A*B*b*d**3*i + 2*B*
*2*b*d**3*i))/(2*b**2*g**3*(a*d - b*c)) + (B**2*c**2*i + 2*B**2*c*d*i*x + B
**2*d**2*i*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d*g**3 - 2*a**2*b*c*
g**3 + 4*a**2*b*d*g**3*x - 4*a*b**2*c*g**3*x + 2*a*b**2*d*g**3*x**2 - 2*b**
3*c*g**3*x**2) - (2*A**2*a*d*i + 2*A**2*b*c*i + 2*A*B*a*d*i + 2*A*B*b*c*i +
 B**2*a*d*i + B**2*b*c*i + x*(4*A**2*b*d*i + 4*A*B*b*d*i + 2*B**2*b*d*i))/(
4*a**2*b**2*g**3 + 8*a*b**3*g**3*x + 4*b**4*g**3*x**2) + (-2*A*B*a*d*i - 2*
A*B*b*c*i - 4*A*B*b*d*i*x - B**2*a*d*i - B**2*b*c*i - 2*B**2*b*d*i*x)*log(e
*(a + b*x)/(c + d*x))/(2*a**2*b**2*g**3 + 4*a*b**3*g**3*x + 2*b**4*g**3*x**
2)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^
3, x)
```

3.62 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=287

$$-\frac{bi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^2}-\frac{2bBi(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^2}+\frac{di(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^4(a+bx)^2(bc-ad)^2}+\frac{Bdi(c}{}$$

```
[Out] (B^2*d*i*(c + d*x)^2)/(4*(b*c - a*d)^2*g^4*(a + b*x)^2) - (2*b*B^2*i*(c + d
*x)^3)/(27*(b*c - a*d)^2*g^4*(a + b*x)^3) + (B*d*i*(c + d*x)^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (2*b*B*i*(c +
 d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^2*g^4*(a + b*x
)^3) + (d*i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a
*d)^2*g^4*(a + b*x)^2) - (b*i*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2)/(3*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Rubi [C] time = 2.2905, antiderivative size = 741, normalized size of antiderivative = 2.58, number of steps used = 66, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^3i\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^2g^4(bc-ad)^2}+\frac{B^2d^3i\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3b^2g^4(bc-ad)^2}+\frac{Bd^3i\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^2g^4(bc-ad)^2}-\frac{Bd^3i\log(c+dx)}{3b^2g^4}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^4,
x]
```

```
[Out] (-2*B^2*(b*c - a*d)*i)/(27*b^2*g^4*(a + b*x)^3) + (B^2*d*i)/(36*b^2*g^4*(a
+ b*x)^2) + (5*B^2*d^2*i)/(18*b^2*(b*c - a*d)*g^4*(a + b*x)) + (5*B^2*d^3*i
*Log[a + b*x])/(18*b^2*(b*c - a*d)^2*g^4) - (B^2*d^3*i*Log[a + b*x]^2)/(6*b
^2*(b*c - a*d)^2*g^4) - (2*B*(b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(9*b^2*g^4*(a + b*x)^3) - (B*d*i*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(6*b^2*g^4*(a + b*x)^2) + (B*d^2*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(3*b^2*(b*c - a*d)*g^4*(a + b*x)) + (B*d^3*i*Log[a + b*x]*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(3*b^2*(b*c - a*d)^2*g^4) - ((b*c - a*d)*i*(A + B*Log[
(e*(a + b*x))/(c + d*x)])^2)/(3*b^2*g^4*(a + b*x)^3) - (d*i*(A + B*Log[(e*(
a + b*x))/(c + d*x)])^2)/(2*b^2*g^4*(a + b*x)^2) - (5*B^2*d^3*i*Log[c + d*x
])/(18*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*Log[-((d*(a + b*x))/(b*c - a*d))
]*Log[c + d*x])/(3*b^2*(b*c - a*d)^2*g^4) - (B*d^3*i*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x])/(3*b^2*(b*c - a*d)^2*g^4) - (B^2*d^3*i*Log[c +
 d*x]^2)/(6*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*Log[a + b*x]*Log[(b*(c + d*
x))/(b*c - a*d)])/(3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*PolyLog[2, -((d*(a
 + b*x))/(b*c - a*d))])/(3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/(3*b^2*(b*c - a*d)^2*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(62c+62dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx=\int\left(\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^4(a+bx)^4}+\frac{62d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^4(a+bx)^3}\right)dx$$

$$=\frac{(62d)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}\,dx}{bg^4}+\frac{(62(bc-ad))\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}\,dx}{bg^4}$$

$$=-\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{31d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^4(a+bx)^2}+\frac{(62B\ldots}{\ldots}$$

$$=-\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{31d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^4(a+bx)^2}+\frac{(62B\ldots}{\ldots}$$

$$=-\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{31d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^4(a+bx)^2}+\frac{(62B\ldots}{\ldots}$$

$$=-\frac{62(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{31d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^4(a+bx)^2}-\frac{(124\ldots}{\ldots}$$

$$=-\frac{124B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^2g^4(a+bx)^3}-\frac{31Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2g^4(a+bx)^2}+\frac{62\ldots}{3\ldots}$$

$$=-\frac{124B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^2g^4(a+bx)^3}-\frac{31Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2g^4(a+bx)^2}+\frac{62\ldots}{3\ldots}$$

$$=-\frac{124B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^2g^4(a+bx)^3}-\frac{31Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b^2g^4(a+bx)^2}+\frac{62\ldots}{3\ldots}$$

$$=-\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3}+\frac{31B^2d}{18b^2g^4(a+bx)^2}+\frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx)}+\frac{155B^2\ldots}{9b^2(\ldots}$$

$$=-\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3}+\frac{31B^2d}{18b^2g^4(a+bx)^2}+\frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx)}+\frac{155B^2\ldots}{9b^2(\ldots}$$

$$=-\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3}+\frac{31B^2d}{18b^2g^4(a+bx)^2}+\frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx)}+\frac{155B^2\ldots}{9b^2(\ldots}$$

$$=-\frac{124B^2(bc-ad)}{27b^2g^4(a+bx)^3}+\frac{31B^2d}{18b^2g^4(a+bx)^2}+\frac{155B^2d^2}{9b^2(bc-ad)g^4(a+bx)}+\frac{155B^2\ldots}{9b^2(\ldots}$$

Mathematica [C] time = 1.10025, size = 1035, normalized size = 3.61

$$-\frac{i\left(36\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(bc-ad)^3+54d(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(bc-ad)^2+27Bd(a+bx)\left(2\left(A+B\log\left(\ldots\right.\right.\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^4,x]
```

```
[Out] -(i*(36*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 54*d*(b*c -
a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 27*B*d*(a + b*x)*
(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*
(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Log[a +
b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e
*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a +
b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b
*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*L
og[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(
c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B
*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[
c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 2*B*(12*(b*c - a*d)^
3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A +
B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*
(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d
*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a +
b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(
b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*
Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*
(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^
3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[
(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) +
 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])
*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(108*b^2*(b*c -
 a*d)^2*g^4*(a + b*x)^3)
```

Maple [B] time = 0.055, size = 1765, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x)
```

```
[Out] 1/2*e^2*d^2*i/(a*d-b*c)^3/g^4*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1
/2*e^2*d*i/(a*d-b*c)^3/g^4*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-1/
3*e^3*d*i/(a*d-b*c)^3/g^4*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+1/3
*e^3*i/(a*d-b*c)^3/g^4*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+e^2*
d^2*i/(a*d-b*c)^3/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*a-e^2*d*i/(a*d-b*c)^3/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/2*e^2*d^2*i/(a*d-b*c)^3
/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2*e^2*d*i/(a*d-b*c)^3/g^
4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-2/3*e^3*d*i/(a*d-b*c)^3/g^4
*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*a+2/3*e^3*i/(a*d-b*c)^3/g^4*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/9*e^3*d*i/(a*d-b*c)^3/g^4*A*B*b/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+2/9*e^3*i/(a*d-b*c)^3/g^4*A*B*b^2/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/2*e^2*d^2*i/(a*d-b*c)^3/g^4*B^2/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*e^2*d
*i/(a*d-b*c)^3/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2*b*c+1/2*e^2*d^2*i/(a*d-b*c)^3/g^4*B^2/(b*e/d+e/(d*x+c)*
```

```
a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^2*d*i/(a*d-b*c
)^3/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*b*c+1/4*e^2*d^2*i/(a*d-b*c)^3/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^2*a-1/4*e^2*d*i/(a*d-b*c)^3/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^2*b*c-1/3*e^3*d*i/(a*d-b*c)^3/g^4*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b
*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/3*e^3*i/(a*d-b*c)^3/g^4*B^2*b^2
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-
2/9*e^3*d*i/(a*d-b*c)^3/g^4*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/9*e^3*i/(a*d-b*c)^3/g^4*B^2*b^2/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/27*e^3*d*i/
(a*d-b*c)^3/g^4*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+2/27*e^3*i/(a
*d-b*c)^3/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c
```

Maxima [B] time = 2.51904, size = 4431, normalized size = 15.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algor
ithm="maxima")
```

```
[Out] -1/6*(3*b*x + a)*B^2*d*i*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^4*x^
3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/54*(6*((6*b^2*d^2*
x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6
*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d +
a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x
+ (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4
*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x +
c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(b*e*x
/(d*x + c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2
 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*
d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b
^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*
a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b
*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*
a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x
 + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*
g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^
4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b
^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*
g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*
c*i - 1/108*(6*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*
b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*
a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d
^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^
4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x +
 a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*
b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 -
 a^3*b^2*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (19*a*b^3*c^3 -
189*a^2*b^2*c^2*d + 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a*b
^3*c*d^2 + 5*a^2*b^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2
- a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2
 - a^3*b*d^3)*x)*log(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^
2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d
^2 - a^3*b*d^3)*x)*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*a^
2*b^2*c*d^2 - 19*a^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d
```

```
^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*
b^2*c*d^2 - 5*a^3*b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 +
(27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 +
 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4
*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^
2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^5*c^3*g^4 - 3*a^
4*b^4*c^2*d*g^4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 - 3*
a*b^7*c^2*d*g^4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b^7*c^3
*g^4 - 3*a^2*b^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x^2 + 3
*(a^2*b^6*c^3*g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b^3*d^3
*g^4)*x))*B^2*d*i - 1/18*A*B*d*i*(6*(3*b*x + a)*log(b*e*x/(d*x + c) + a*e/(
d*x + c))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) +
 (5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 +
3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2
*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3
*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b
^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 -
 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3
)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g
^4)) - 1/9*A*B*c*i*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3
*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 +
3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^
3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*
g^4) + 6*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^
2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c
^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3
*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*c*i*log(b*e*x/(
d*x + c) + a*e/(d*x + c))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*
x + a^3*b*g^4) - 1/6*(3*b*x + a)*A^2*d*i/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3
*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*A^2*c*i/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2
+ 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 0.560472, size = 1249, normalized size = 4.35

$$\frac{6\left(\left(6\,AB+5\,B^2\right)b^3cd^2-\left(6\,AB+5\,B^2\right)ab^2d^3\right)ix^2-3\left(\left(18\,A^2+6\,AB-B^2\right)b^3c^2d-18\left(2\,A^2+2\,AB+B^2\right)ab^2cd^2+\left(18\,A^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algor
ithm="fricas")
```

```
[Out] 1/108*(6*((6*A*B + 5*B^2)*b^3*c*d^2 - (6*A*B + 5*B^2)*a*b^2*d^3)*i*x^2 - 3*
((18*A^2 + 6*A*B - B^2)*b^3*c^2*d - 18*(2*A^2 + 2*A*B + B^2)*a*b^2*c*d^2 +
(18*A^2 + 30*A*B + 19*B^2)*a^2*b*d^3)*i*x + 18*(B^2*b^3*d^3*i*x^3 + 3*B^2*a
*b^2*d^3*i*x^2 - 3*(B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2)*i*x - (2*B^2*b^3*c^3
 - 3*B^2*a*b^2*c^2*d)*i)*log((b*e*x + a*e)/(d*x + c))^2 - (4*(9*A^2 + 6*A*B
 + 2*B^2)*b^3*c^3 - 27*(2*A^2 + 2*A*B + B^2)*a*b^2*c^2*d + (18*A^2 + 30*A*B
 + 19*B^2)*a^3*d^3)*i + 6*((6*A*B + 5*B^2)*b^3*d^3*i*x^3 + 3*(2*B^2*b^3*c*d
^2 + 3*(2*A*B + B^2)*a*b^2*d^3)*i*x^2 - 3*((6*A*B + B^2)*b^3*c^2*d - 6*(2*A
*B + B^2)*a*b^2*c*d^2)*i*x - (4*(3*A*B + B^2)*b^3*c^3 - 9*(2*A*B + B^2)*a*b
^2*c^2*d)*i)*log((b*e*x + a*e)/(d*x + c)))/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^
5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a
^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*
c*d + a^5*b^2*d^2)*g^4)
```

Sympy [B] time = 27.9882, size = 1386, normalized size = 4.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -B*d**3*i*(6*A + 5*B)*log(x + (6*A*B*a*d**4*i + 6*A*B*b*c*d**3*i + 5*B**2*a
*d**4*i + 5*B**2*b*c*d**3*i - B*a**3*d**6*i*(6*A + 5*B)/(a*d - b*c)**2 + 3*
B*a**2*b*c*d**5*i*(6*A + 5*B)/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**4*i*(6*A
+ 5*B)/(a*d - b*c)**2 + B*b**3*c**3*d**3*i*(6*A + 5*B)/(a*d - b*c)**2)/(12*
A*B*b*d**4*i + 10*B**2*b*d**4*i))/(18*b**2*g**4*(a*d - b*c)**2) + B*d**3*i*
(6*A + 5*B)*log(x + (6*A*B*a*d**4*i + 6*A*B*b*c*d**3*i + 5*B**2*a*d**4*i +
5*B**2*b*c*d**3*i + B*a**3*d**6*i*(6*A + 5*B)/(a*d - b*c)**2 - 3*B*a**2*b*c
*d**5*i*(6*A + 5*B)/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d**4*i*(6*A + 5*B)/(a*
d - b*c)**2 - B*b**3*c**3*d**3*i*(6*A + 5*B)/(a*d - b*c)**2)/(12*A*B*b*d**4
*i + 10*B**2*b*d**4*i))/(18*b**2*g**4*(a*d - b*c)**2) + (3*B**2*a*c**2*d*i
+ 6*B**2*a*c*d**2*i*x + 3*B**2*a*d**3*i*x**2 - 2*B**2*b*c**3*i - 3*B**2*b*c
**2*d*i*x + B**2*b*d**3*i*x**3)*log(e*(a + b*x)/(c + d*x))**2/(6*a**5*d**2*
g**4 - 12*a**4*b*c*d*g**4 + 18*a**4*b*d**2*g**4*x + 6*a**3*b**2*c**2*g**4 -
 36*a**3*b**2*c*d*g**4*x + 18*a**3*b**2*d**2*g**4*x**2 + 18*a**2*b**3*c**2*
g**4*x - 36*a**2*b**3*c*d*g**4*x**2 + 6*a**2*b**3*d**2*g**4*x**3 + 18*a*b**
4*c**2*g**4*x**2 - 12*a*b**4*c*d*g**4*x**3 + 6*b**5*c**2*g**4*x**3) + (-6*A
*B*a**2*d**2*i - 6*A*B*a*b*c*d*i - 18*A*B*a*b*d**2*i*x + 12*A*B*b**2*c**2*i
 + 18*A*B*b**2*c*d*i*x - 5*B**2*a**2*d**2*i - 5*B**2*a*b*c*d*i - 15*B**2*a*
b*d**2*i*x + 4*B**2*b**2*c**2*i + 3*B**2*b**2*c*d*i*x - 6*B**2*b**2*d**2*i*
x**2)*log(e*(a + b*x)/(c + d*x))/(18*a**4*b**2*d*g**4 - 18*a**3*b**3*c*g**4
 + 54*a**3*b**3*d*g**4*x - 54*a**2*b**4*c*g**4*x + 54*a**2*b**4*d*g**4*x**2
 - 54*a*b**5*c*g**4*x**2 + 18*a*b**5*d*g**4*x**3 - 18*b**6*c*g**4*x**3) - (
18*A**2*a**2*d**2*i + 18*A**2*a*b*c*d*i - 36*A**2*b**2*c**2*i + 30*A*B*a**2
*d**2*i + 30*A*B*a*b*c*d*i - 24*A*B*b**2*c**2*i + 19*B**2*a**2*d**2*i + 19*
B**2*a*b*c*d*i - 8*B**2*b**2*c**2*i + x**2*(36*A*B*b**2*d**2*i + 30*B**2*b*
*2*d**2*i) + x*(54*A**2*a*b*d**2*i - 54*A**2*b**2*c*d*i + 90*A*B*a*b*d**2*i
 - 18*A*B*b**2*c*d*i + 57*B**2*a*b*d**2*i + 3*B**2*b**2*c*d*i))/(108*a**4*b
**2*d*g**4 - 108*a**3*b**3*c*g**4 + x**3*(108*a*b**5*d*g**4 - 108*b**6*c*g*
*4) + x**2*(324*a**2*b**4*d*g**4 - 324*a*b**5*c*g**4) + x*(324*a**3*b**3*d*
g**4 - 324*a**2*b**4*c*g**4))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(bgx + ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^
4, x)
```

3.63 $\int \frac{(ci+dix)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=445

$$-\frac{b^2i(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^3}-\frac{b^2Bi(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^5(a+bx)^2(bc-ad)^3}-\frac{Bd^2i(c$$

```
[Out] -(B^2*d^2*i*(c + d*x)^2)/(4*(b*c - a*d)^3*g^5*(a + b*x)^2) + (4*b*B^2*d*i*(
c + d*x)^3)/(27*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*B^2*i*(c + d*x)^4)/(3
2*(b*c - a*d)^3*g^5*(a + b*x)^4) - (B*d^2*i*(c + d*x)^2*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (4*b*B*d*i*(c + d*x)
^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^3*g^5*(a + b*x)^3)
- (b^2*B*i*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)
^3*g^5*(a + b*x)^4) - (d^2*i*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
])^2)/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*d*i*(c + d*x)^3*(A + B*Log[(
e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*i*(c +
 d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*(b*c - a*d)^3*g^5*(a + b
*x)^4)
```

Rubi [C] time = 2.61133, antiderivative size = 826, normalized size of antiderivative = 1.86, number of steps used = 74, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i\log^2(a+bx)d^4}{12b^2(bc-ad)^3g^5}+\frac{B^2i\log^2(c+dx)d^4}{12b^2(bc-ad)^3g^5}-\frac{13B^2i\log(a+bx)d^4}{72b^2(bc-ad)^3g^5}-\frac{Bi\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^4}{6b^2(bc-ad)^3g^5}+\frac{13B^2i\log(c+}{72b^2(bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^5,
x]
```

```
[Out] -(B^2*(b*c - a*d)*i)/(32*b^2*g^5*(a + b*x)^4) + (5*B^2*d*i)/(216*b^2*g^5*(a
 + b*x)^3) + (B^2*d^2*i)/(144*b^2*(b*c - a*d)*g^5*(a + b*x)^2) - (13*B^2*d^
3*i)/(72*b^2*(b*c - a*d)^2*g^5*(a + b*x)) - (13*B^2*d^4*i*Log[a + b*x])/(72
*b^2*(b*c - a*d)^3*g^5) + (B^2*d^4*i*Log[a + b*x]^2)/(12*b^2*(b*c - a*d)^3*
g^5) - (B*(b*c - a*d)*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*b^2*g^5*(a
 + b*x)^4) - (B*d*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(18*b^2*g^5*(a +
b*x)^3) + (B*d^2*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(12*b^2*(b*c - a*d
)*g^5*(a + b*x)^2) - (B*d^3*i*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b^2*
(b*c - a*d)^2*g^5*(a + b*x)) - (B*d^4*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(6*b^2*(b*c - a*d)^3*g^5) - ((b*c - a*d)*i*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/(4*b^2*g^5*(a + b*x)^4) - (d*i*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(3*b^2*g^5*(a + b*x)^3) + (13*B^2*d^4*i*Log[c + d*x])/(
72*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Lo
g[c + d*x])/(6*b^2*(b*c - a*d)^3*g^5) + (B*d^4*i*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x])/(6*b^2*(b*c - a*d)^3*g^5) + (B^2*d^4*i*Log[c + d*x
]^2)/(12*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*Log[a + b*x]*Log[(b*(c + d*x))
/(b*c - a*d)])/(6*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))])/(6*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])/(6*b^2*(b*c - a*d)^3*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(63c+63dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}dx = \int \left(\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^5(a+bx)^5}+\frac{63d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^5(a+bx)^4}\right)dx$$

$$= \frac{(63d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}dx}{bg^5} + \frac{(63(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^5}dx}{bg^5}$$

$$= -\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{21d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^5(a+bx)^3} + \frac{(42B\ldots}{\ldots}$$

$$= -\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{21d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^5(a+bx)^3} + \frac{(42B\ldots}{\ldots}$$

$$= -\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{21d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^5(a+bx)^3} + \frac{(42B\ldots}{\ldots}$$

$$= -\frac{63(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{21d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^5(a+bx)^3} - \frac{(63B\ldots}{\ldots}$$

$$= -\frac{63B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^2g^5(a+bx)^4} - \frac{7Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^5(a+bx)^3} + \frac{21Bd\ldots}{4b^2\ldots}$$

$$= -\frac{63B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^2g^5(a+bx)^4} - \frac{7Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^5(a+bx)^3} + \frac{21Bd\ldots}{4b^2\ldots}$$

$$= -\frac{63B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^2g^5(a+bx)^4} - \frac{7Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b^2g^5(a+bx)^3} + \frac{21Bd\ldots}{4b^2\ldots}$$

$$= -\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4} + \frac{35B^2d}{24b^2g^5(a+bx)^3} + \frac{7B^2d^2}{16b^2(bc-ad)g^5(a+bx)^2} - \frac{\ldots}{8b^2(\ldots}$$

$$= -\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4} + \frac{35B^2d}{24b^2g^5(a+bx)^3} + \frac{7B^2d^2}{16b^2(bc-ad)g^5(a+bx)^2} - \frac{\ldots}{8b^2(\ldots}$$

$$= -\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4} + \frac{35B^2d}{24b^2g^5(a+bx)^3} + \frac{7B^2d^2}{16b^2(bc-ad)g^5(a+bx)^2} - \frac{\ldots}{8b^2(\ldots}$$

$$= -\frac{63B^2(bc-ad)}{32b^2g^5(a+bx)^4} + \frac{35B^2d}{24b^2g^5(a+bx)^3} + \frac{7B^2d^2}{16b^2(bc-ad)g^5(a+bx)^2} - \frac{\ldots}{8b^2(\ldots}$$

Mathematica [C] time = 1.71301, size = 1340, normalized size = 3.01

$$-\frac{i\left(216\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(bc-ad)^4-288d(ad-bc)^3(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+16Bd(a+bx)\left(12\left(A+B\log\ldots\right.\right.\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g
*x)^5,x]
```

```
[Out] -(i*(216*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 288*d*(-(b*
c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 16*B*d*(a +
b*x)*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a
*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(
a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a
+ b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d +
 d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b
*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x]
 + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)
^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*
x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(
Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x
))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) +
a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])) + 3*B*(36*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 48*d*(-(
b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^2*(b*c
- a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^3*(-(b*c)
 + a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 144*d^4*(a + b*x
)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^4*(a + b*x)^4
*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 144*B*d^3*(a + b*x)^3*
(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^
2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*
x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)*(2*(b
*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 +
 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*(3*
(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b
*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x]
 + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(L
og[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x)
)/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
))))/(864*b^2*(b*c - a*d)^3*g^5*(a + b*x)^4)
```

Maple [B] time = 0.053, size = 2689, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x)
```

```
[Out] 1/2*e^4*d*i/(a*d-b*c)^4/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e^2*d^2*i/(a*d-b*c)^4/g^5*A*B/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/8*e^4*i/(a*
d-b*c)^4/g^5*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c-1/2*e^2*d^2*i/
(a*d-b*c)^4/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-2/3*e^3*d^2*i
/(a*d-b*c)^4/g^5*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/4*e^4*i/(a
*d-b*c)^4/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2*c-1/8*e^4*i/(a*d-b*c)^4/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e
/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2*e^2*d^3*i/(a*d-b*c)
^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2*a-1/32*e^4*i/(a*d-b*c)^4/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^4*c-4/3*e^3*d^2*i/(a*d-b*c)^4/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4/3*e^3*d*i/(a*d-b*c)^4/g^5*A*B*
b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c
-1/4*e^4*i/(a*d-b*c)^4/g^5*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+
```

```
1/2*e^2*d^3*i/(a*d-b*c)^4/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1
/4*e^2*d^3*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+4/
9*e^3*d*i/(a*d-b*c)^4/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1
/8*e^4*d*i/(a*d-b*c)^4/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-
1/2*e^4*i/(a*d-b*c)^4/g^5*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/2*e^2*d^2*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c-1/2*e^2*d
^2*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*b*c-2/3*e^3*d^2*i/(a*d-b*c)^4/g^5*B^2*b/(b*e/d+e/(d*x+c
)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2/3*e^3*d*i/(a*d
-b*c)^4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))^2*c-1/2*e^2*d^2*i/(a*d-b*c)^4/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)^2*b*c-4/9*e^3*d^2*i/(a*d-b*c)^4/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-
e/d/(d*x+c)*b*c)^3*a+1/32*e^4*d*i/(a*d-b*c)^4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*
a-e/d/(d*x+c)*b*c)^4*a+1/2*e^2*d^3*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/3*e^3*d*i/(a*d-b*c)
^4/g^5*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/4*e^4*d*i/(a*d-b*c
)^4/g^5*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/2*e^2*d^3*i/(a*d-
b*c)^4/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2*d^2*i/(a*d-b
*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-4/27*e^3*d^2*i/(a*d
-b*c)^4/g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+4/27*e^3*d*i/(a*d
-b*c)^4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+4/9*e^3*d*i/(a*
d-b*c)^4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*c+1/4*e^4*d*i/(a*d-b*c)^4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/8*e^4*d*i/(a*d-b*c)^
4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*a+e^2*d^3*i/(a*d-b*c)^4/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c
)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4/9*e^3*d^2*i/(a*d-b*c)^4/g^5*B^2*b/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a
```

Maxima [B] time = 3.39295, size = 6491, normalized size = 14.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="maxima")
```

```
[Out] -1/12*(4*b*x + a)*B^2*d*i*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^5*x
^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) +
 1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^
2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d
^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*
d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2
*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^
4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*e*x/
(d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*
d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(
13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 +
 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a
)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
 + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^
```

```
2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2
*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100
*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b
^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)
*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6
*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a
*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*
g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^
6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5
)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 -
4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c*i - 1/864*(12*((7*a*b^3*c^
3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^
3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^
4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*
a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2
*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^
3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a
^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*
b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*lo
g(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3
 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b
^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5))*log(b*e
*x/(d*x + c) + a*e/(d*x + c)) + (37*a*b^4*c^4 - 304*a^2*b^3*c^3*d + 1512*a^
3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 + 12*(88*b^5*c^2*d^2 - 101*a
*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5*c^3*d - 609*a*b^4*c^2*d^2 + 64
8*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^
5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b
^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x +
a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a
*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(
4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(d*x + c)^2 + 4*(16*b^5*c^4 - 163*a*b^4*
c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*c*d^3 + 115*a^4*b*d^4)*x + 12*(
88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b
^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2
+ 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x)*log(b*x + a) - 12*(88*a^4*b*c*d^3
- 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a
^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2
*c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b
^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^
3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x + a))*log(d*x +
 c))/(a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*g^5 + 6*a^6*b^4*c^2*d^2*g^5 - 4*a^7
*b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10*c^4*g^5 - 4*a*b^9*c^3*d*g^5 + 6*a^
2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 + a^4*b^6*d^4*g^5)*x^4 + 4*(a*b^9*c
^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*d^2*g^5 - 4*a^4*b^6*c*d^3*g^5
+ a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 - 4*a^3*b^7*c^3*d*g^5 + 6*a^4*b
^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6*b^4*d^4*g^5)*x^2 + 4*(a^3*b^7*c^
4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2*d^2*g^5 - 4*a^6*b^4*c*d^3*g^5 +
 a^7*b^3*d^4*g^5)*x))*B^2*d*i - 1/72*A*B*d*i*(12*(4*b*x + a)*log(b*e*x/(d*x
 + c) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 +
 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*
b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d -
29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^
2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2
- a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 -
 a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2
- a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2
 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 -
a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5
```

```
*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*
c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 -
 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) + 1/24*A*B*c*i*((12*b^3*d^3*x^3 - 3*b
^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*
b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 -
3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a
^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*
a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3
*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^
5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 12*log(b*e*x/(d*x + c) +
a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b
^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a
^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((
b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*
g^5)) - 1/4*B^2*c*i*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^5*x^4 + 4
*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/12*(4
*b*x + a)*A^2*d*i/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^
3*b^3*g^5*x + a^4*b^2*g^5) - 1/4*A^2*c*i/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6
*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 0.582325, size = 2048, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="fricas")
```

```
[Out] -1/864*(12*((12*A*B + 13*B^2)*b^4*c*d^3 - (12*A*B + 13*B^2)*a*b^3*d^4)*i*x^
3 - 6*((12*A*B + B^2)*b^4*c^2*d^2 - 16*(6*A*B + 5*B^2)*a*b^3*c*d^3 + (84*A*
B + 79*B^2)*a^2*b^2*d^4)*i*x^2 + 4*((72*A^2 + 12*A*B - 5*B^2)*b^4*c^3*d - 1
2*(18*A^2 + 6*A*B - B^2)*a*b^3*c^2*d^2 + 108*(2*A^2 + 2*A*B + B^2)*a^2*b^2*
c*d^3 - (72*A^2 + 156*A*B + 115*B^2)*a^3*b*d^4)*i*x + 72*(B^2*b^4*d^4*i*x^4
 + 4*B^2*a*b^3*d^4*i*x^3 + 6*B^2*a^2*b^2*d^4*i*x^2 + 4*(B^2*b^4*c^3*d - 3*B
^2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*c*d^3)*i*x + (3*B^2*b^4*c^4 - 8*B^2*a*b^3*
c^3*d + 6*B^2*a^2*b^2*c^2*d^2)*i)*log((b*e*x + a*e)/(d*x + c))^2 + (27*(8*A
^2 + 4*A*B + B^2)*b^4*c^4 - 64*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*c^3*d + 216*(2
*A^2 + 2*A*B + B^2)*a^2*b^2*c^2*d^2 - (72*A^2 + 156*A*B + 115*B^2)*a^4*d^4)
*i + 12*((12*A*B + 13*B^2)*b^4*d^4*i*x^4 + 4*(3*B^2*b^4*c*d^3 + 2*(6*A*B +
5*B^2)*a*b^3*d^4)*i*x^3 - 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 6*(2*A*B
 + B^2)*a^2*b^2*d^4)*i*x^2 + 4*((12*A*B + B^2)*b^4*c^3*d - 6*(6*A*B + B^2)*
a*b^3*c^2*d^2 + 18*(2*A*B + B^2)*a^2*b^2*c*d^3)*i*x + (9*(4*A*B + B^2)*b^4*
c^4 - 32*(3*A*B + B^2)*a*b^3*c^3*d + 36*(2*A*B + B^2)*a^2*b^2*c^2*d^2)*i)*l
og((b*e*x + a*e)/(d*x + c)))/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 -
a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a
^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 -
a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 -
 a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^
7*b^2*d^3)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{(bgx+ag)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^
5, x)
```

3.64 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=711

$$-\frac{B^2g^3i^2(bc-ad)^6\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{30b^3d^4}-\frac{Bg^3i^2(bc-ad)^6\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+11B\right)}{180b^3d^4}-\frac{Bg^3i^2(a+bx)(}{}$$

```
[Out] (3*B^2*(b*c - a*d)^5*g^3*i^2*x)/(20*b^2*d^3) + (B^2*(b*c - a*d)^2*g^3*i^2*(
a + b*x)^4)/(60*b^3) - (3*B^2*(b*c - a*d)^4*g^3*i^2*(c + d*x)^2)/(40*b*d^4)
 + (B^2*(b*c - a*d)^3*g^3*i^2*(c + d*x)^3)/(60*d^4) - (B*(b*c - a*d)^3*g^3*
i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(90*b^3*d) - (B*(b*c
- a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^3)
 - (B*(b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(15*b^2) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(60*b^3) + ((b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)
*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(15*b^2) + (g^3*i^2*(a + b*x)^4*(c
 + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*b) + (B*(b*c - a*d)^4*
g^3*i^2*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*
d^2) - (B*(b*c - a*d)^5*g^3*i^2*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x)
)/(c + d*x)]))/(180*b^3*d^3) - (B*(b*c - a*d)^6*g^3*i^2*Log[(b*c - a*d)/(b*
(c + d*x))]*(6*A + 11*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^4)
- (B^2*(b*c - a*d)^6*g^3*i^2*Log[c + d*x])/(20*b^3*d^4) - (B^2*(b*c - a*d)^
6*g^3*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(30*b^3*d^4)
```

Rubi [A] time = 3.00598, antiderivative size = 790, normalized size of antiderivative = 1.11, number of steps used = 86, number of rules used = 13, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3i^2(bc-ad)^6\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{30b^3d^4}+\frac{Bg^3i^2(bc-ad)^6\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{30b^3d^4}+\frac{Bg^3i^2(a+bx)^2(bc-ad)^4}{60b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,
x]
```

```
[Out] -(A*B*(b*c - a*d)^5*g^3*i^2*x)/(30*b^2*d^3) + (B^2*(b*c - a*d)^5*g^3*i^2*x)
/(45*b^2*d^3) - (7*B^2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2)/(360*b^3*d^2) + (
B^2*(b*c - a*d)^3*g^3*i^2*(a + b*x)^3)/(60*b^3*d) + (B^2*(b*c - a*d)^2*g^3*
i^2*(a + b*x)^4)/(60*b^3) - (B^2*(b*c - a*d)^5*g^3*i^2*(a + b*x)*Log[(e*(a
+ b*x))/(c + d*x)])/(30*b^3*d^3) + (B*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^3*d^2) - (B*(b*c - a*d)^3*g^3*i^2*
(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(90*b^3*d) - (7*B*(b*c -
a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^3) -
 (B*d*(b*c - a*d)*g^3*i^2*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(15*b^3) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])^2)/(4*b^3) + (2*d*(b*c - a*d)*g^3*i^2*(a + b*x)^5*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/(5*b^3) + (d^2*g^3*i^2*(a + b*x)^6*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/(6*b^3) + (B^2*(b*c - a*d)^6*g^3*i^2*Log[c + d*x])/
(90*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/(30*b^3*d^4) + (B*(b*c - a*d)^6*g^3*i^2*(A + B*Log[(e*(a + b
*x))/(c + d*x)])*Log[c + d*x])/(30*b^3*d^4) + (B^2*(b*c - a*d)^6*g^3*i^2*Lo
g[c + d*x]^2)/(60*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*PolyLog[2, (b*(c +
```

```
d*x))/(b*c - a*d)])/(30*b^3*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (64c + 64dx)^2(ag + bgx)^3\left(A + B\log\left(\frac{e(a + bx)}{c + dx}\right)\right)^2 dx = \int\left(\frac{4096(bc - ad)^2(ag + bgx)^3\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2} + \frac{8192\ldots}{\ldots}\right.$$

$$= \frac{\left(4096(bc - ad)^2\right)\int (ag + bgx)^3\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{b^2} + \frac{(\ldots}{\ldots}$$

$$= \frac{1024(bc - ad)^2g^3(a + bx)^4\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3} + \frac{8192d(bc\ldots}{\ldots}$$

$$= \frac{1024(bc - ad)^2g^3(a + bx)^4\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3} + \frac{8192d(bc\ldots}{\ldots}$$

$$= \frac{1024(bc - ad)^2g^3(a + bx)^4\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3} + \frac{8192d(bc\ldots}{\ldots}$$

$$= \frac{1024(bc - ad)^2g^3(a + bx)^4\left(A + B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3} + \frac{8192d(bc\ldots}{\ldots}$$

$$= -\frac{2048AB(bc - ad)^5g^3x}{15b^2d^3} + \frac{1024B(bc - ad)^4g^3(a + bx)^2\left(A + \ldots\right.}{15b^3d^2}$$

$$= -\frac{2048AB(bc - ad)^5g^3x}{15b^2d^3} - \frac{2048B^2(bc - ad)^5g^3(a + bx)\log\left(\ldots\right.}{15b^3d^3}$$

$$= -\frac{2048AB(bc - ad)^5g^3x}{15b^2d^3} - \frac{2048B^2(bc - ad)^5g^3(a + bx)\log\left(\ldots\right.}{15b^3d^3}$$

$$= -\frac{2048AB(bc - ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc - ad)^5g^3x}{45b^2d^3} - \frac{3584B^2(b\ldots}{\ldots}$$

$$= -\frac{2048AB(bc - ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc - ad)^5g^3x}{45b^2d^3} - \frac{3584B^2(b\ldots}{\ldots}$$

$$= -\frac{2048AB(bc - ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc - ad)^5g^3x}{45b^2d^3} - \frac{3584B^2(b\ldots}{\ldots}$$

$$= -\frac{2048AB(bc - ad)^5g^3x}{15b^2d^3} + \frac{4096B^2(bc - ad)^5g^3x}{45b^2d^3} - \frac{3584B^2(b\ldots}{\ldots}$$

Mathematica [B] time = 1.3484, size = 1559, normalized size = 2.19

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^3*i^2*(15*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2 + 24*d*(b*c - a*d)*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
10*d^2*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (5*B*(b*c - a*d
)^3*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*
x))/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/
```

```
(c + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*
(b*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2
- 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)
*Log[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4
 + (2*B*(b*c - a*d)^2*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a +
 b*x)*Log[(e*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c +
 d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*
(a + b*x))/(c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*
(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*
(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Lo
g[c + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 -
 (B*(b*c - a*d)*(24*b^2*B*c*d*(b*c - a*d)^3*x + 120*A*b*d*(b*c - a*d)^4*x +
 130*b*B*d*(b*c - a*d)^4*x + 24*a*b*B*d^2*(-(b*c) + a*d)^3*x - 12*b*B*c*d^2
*(b*c - a*d)^2*(a + b*x)^2 + 12*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 + 35*B*d^
2*(-(b*c) + a*d)^3*(a + b*x)^2 + 8*b*B*c*d^3*(b*c - a*d)*(a + b*x)^3 + 10*B
*d^3*(b*c - a*d)^2*(a + b*x)^3 + 8*a*B*d^4*(-(b*c) + a*d)*(a + b*x)^3 - 6*b
*B*c*d^4*(a + b*x)^4 + 6*a*B*d^5*(a + b*x)^4 + 120*B*d*(b*c - a*d)^4*(a + b
*x)*Log[(e*(a + b*x))/(c + d*x)] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]) + 24*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(
c + d*x)]) - 24*b*B*c*(b*c - a*d)^4*Log[c + d*x] + 24*a*B*d*(b*c - a*d)^4*L
og[c + d*x] - 250*B*(b*c - a*d)^5*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*L
og[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 60*B*(b*c - a*d)^5*((2*Log[(d*(
a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])))/(6*d^4)))/(60*b^3)
```

Maple [F] time = 3.027, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3}\left(dix+ci\right)^{2}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 2.13798, size = 6990, normalized size = 9.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")
```

```
[Out] 1/6*A^2*b^3*d^2*g^3*i^2*x^6 + 2/5*A^2*b^3*c*d*g^3*i^2*x^5 + 3/5*A^2*a*b^2*d
^2*g^3*i^2*x^5 + 1/4*A^2*b^3*c^2*g^3*i^2*x^4 + 3/2*A^2*a*b^2*c*d*g^3*i^2*x^
```

4 + 3/4*A^2*a^2*b*d^2*g^3*i^2*x^4 + A^2*a*b^2*c^2*g^3*i^2*x^3 + 2*A^2*a^2*b*c*d*g^3*i^2*x^3 + 1/3*A^2*a^3*d^2*g^3*i^2*x^3 + 3/2*A^2*a^2*b*c^2*g^3*i^2*x^2 + A^2*a^3*c*d*g^3*i^2*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^3*c^2*g^3*i^2 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*b*c^2*g^3*i^2 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b^2*c^2*g^3*i^2 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*c^2*g^3*i^2 + 2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^3*c*d*g^3*i^2 + 2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b*c*d*g^3*i^2 + 1/2*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^2*c*d*g^3*i^2 + 1/15*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^3*c*d*g^3*i^2 + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^3*d^2*g^3*i^2 + 1/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a^2*b*d^2*g^3*i^2 + 1/10*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a*b^2*d^2*g^3*i^2 + 1/180*(60*x^6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B*b^3*d^2*g^3*i^2 + A^2*a^3*c^2*g^3*i^2*x - 1/180*(33*a^4*b*c^2*d^4*g^3*i^2 - 6*a^5*c*d^5*g^3*i^2 - 2*(3*g^3*i^2*log(e) + g^3*i^2)*b^5*c^6 + 6*(6*g^3*i^2*log(e) + g^3*i^2)*a*b^4*c^5*d - 3*(30*g^3*i^2*log(e) - g^3*i^2)*a^2*b^3*c^4*d^2 + 2*(60*g^3*i^2*log(e) - 17*g^3*i^2)*a^3*b^2*c^3*d^3)*B^2*log(d*x + c)/(b^2*d^4) + 1/30*(b^6*c^6*g^3*i^2 - 6*a*b^5*c^5*d*g^3*i^2 + 15*a^2*b^4*c^4*d^2*g^3*i^2 - 20*a^3*b^3*c^3*d^3*g^3*i^2 + 15*a^4*b^2*c^2*d^4*g^3*i^2 - 6*a^5*b*c*d^5*g^3*i^2 + a^6*d^6*g^3*i^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^4) + 1/360*(60*B^2*b^6*d^6*g^3*i^2*x^6*log(e)^2 + 24*((6*g^3*i^2*log(e)^2 - g^3*i^2*log(e))*b^6*c*d^5 + (9*g^3*i^2*log(e)^2 + g^3*i^2*log(e))*a*b^5*d^6)*B^2*x^5 + 6*((15*g^3*i^2*log(e)^2 - 7*g^3*i^2*log(e) + g^3*i^2)*b^6*c^2*d^4 + 2*(45*g^3*i^2*log(e)^2 - 3*g^3*i^2*log(e) - g^3*i^2)*a*b^5*c*d^5 + (45*g^3*i^2*log(e)^2 + 13*g^3*i^2*log(e) + g^3*i^2)*a^2*b^4*d^6)*B^2*x^4 - 2*((2*g^3*i^2*log(e) - 3*g^3*i^2)*b^6*c^3*d^3 - 3*(60*g^3*i^2*log(e)^2 - 26*g^3*i^2*log(e) + g^3*i^2)*a*b^5*c^2*d^4 - 3*(120*g^3*i^2*log(e)^2 + 14*g^3*i^2*log(e) - 5*g^3*i^2)*a^2*b^4*c*d^5 - (60*g^3*i^2*log(e)^2 + 38*g^3*i^2*log(e) + 9*g^3*i^2)*a^3*b^3*d^6)*B^2*x^3 + ((6*g^3*i^2*log(e) - 7*g^3*i^2)*b^6*c^4*d^2 - 2*(18*g^3*i^2*log(e) - 23*g^3*i^2)*a*b^5*c^3*d^3 + 60*(9*g^3*i^2*log(e)^2 - 3*g^3*i^2*log(e) - g^3*i^2)*a^2*b^4*c^2*d^4 + 2*(180*g^3*i^2*log(e)^2 + 102*g^3*i^2*log(e) + 5*g^3*i^2)*a^3*b^3*c*d^5 + (6*g^3*i^2*log(e) + 11*g^3*i^2)*a^4*b^2*d^6)*B^2*x^2 - 2*(2*(3*g^3*i^2*log(e) - 2*g^3*i^2)*b^6*c^5*d - 9*(4*g^3*i^2*log(e) - 3*g^3*i^2)*a*b^5*c^4*d^2 + (90*g^3*i^2*log(e) - 77*g^3*i^2)*a^2*b^4*c^3*d^3 - (180*g^3*i^2*log(e)^2 + 30*g^3*i^2*log(e) - 97*g^3*i^2)*a^3*b^3*c^2*d^4 - 3*(12*g^3*i^2*log(e) + 17*g^3*i^2)*a^4*b^2*c*d^5 + 2*(3*g^3*i^2*log(e) + 4*g

```
^3*i^2)*a^5*b*d^6)*B^2*x + 6*(10*B^2*b^6*d^6*g^3*i^2*x^6 + 60*B^2*a^3*b^3*c
^2*d^4*g^3*i^2*x + 12*(2*b^6*c*d^5*g^3*i^2 + 3*a*b^5*d^6*g^3*i^2)*B^2*x^5 +
 15*(b^6*c^2*d^4*g^3*i^2 + 6*a*b^5*c*d^5*g^3*i^2 + 3*a^2*b^4*d^6*g^3*i^2)*B
^2*x^4 + 20*(3*a*b^5*c^2*d^4*g^3*i^2 + 6*a^2*b^4*c*d^5*g^3*i^2 + a^3*b^3*d^
6*g^3*i^2)*B^2*x^3 + 30*(3*a^2*b^4*c^2*d^4*g^3*i^2 + 2*a^3*b^3*c*d^5*g^3*i^
2)*B^2*x^2 + (15*a^4*b^2*c^2*d^4*g^3*i^2 - 6*a^5*b*c*d^5*g^3*i^2 + a^6*d^6*
g^3*i^2)*B^2)*log(b*x + a)^2 + 6*(10*B^2*b^6*d^6*g^3*i^2*x^6 + 60*B^2*a^3*b
^3*c^2*d^4*g^3*i^2*x + 12*(2*b^6*c*d^5*g^3*i^2 + 3*a*b^5*d^6*g^3*i^2)*B^2*x
^5 + 15*(b^6*c^2*d^4*g^3*i^2 + 6*a*b^5*c*d^5*g^3*i^2 + 3*a^2*b^4*d^6*g^3*i^
2)*B^2*x^4 + 20*(3*a*b^5*c^2*d^4*g^3*i^2 + 6*a^2*b^4*c*d^5*g^3*i^2 + a^3*b^
3*d^6*g^3*i^2)*B^2*x^3 + 30*(3*a^2*b^4*c^2*d^4*g^3*i^2 + 2*a^3*b^3*c*d^5*g^
3*i^2)*B^2*x^2 - (b^6*c^6*g^3*i^2 - 6*a*b^5*c^5*d*g^3*i^2 + 15*a^2*b^4*c^4*
d^2*g^3*i^2 - 20*a^3*b^3*c^3*d^3*g^3*i^2)*B^2)*log(d*x + c)^2 + 2*(60*B^2*b
^6*d^6*g^3*i^2*x^6*log(e) + 12*((12*g^3*i^2*log(e) - g^3*i^2)*b^6*c*d^5 + (
18*g^3*i^2*log(e) + g^3*i^2)*a*b^5*d^6)*B^2*x^5 + 3*((30*g^3*i^2*log(e) - 7
*g^3*i^2)*b^6*c^2*d^4 + 6*(30*g^3*i^2*log(e) - g^3*i^2)*a*b^5*c*d^5 + (90*g
^3*i^2*log(e) + 13*g^3*i^2)*a^2*b^4*d^6)*B^2*x^4 - 2*(b^6*c^3*d^3*g^3*i^2 -
 3*(60*g^3*i^2*log(e) - 13*g^3*i^2)*a*b^5*c^2*d^4 - 3*(120*g^3*i^2*log(e) +
 7*g^3*i^2)*a^2*b^4*c*d^5 - (60*g^3*i^2*log(e) + 19*g^3*i^2)*a^3*b^3*d^6)*B
^2*x^3 + 3*(b^6*c^4*d^2*g^3*i^2 - 6*a*b^5*c^3*d^3*g^3*i^2 + a^4*b^2*d^6*g^3
*i^2 + 30*(6*g^3*i^2*log(e) - g^3*i^2)*a^2*b^4*c^2*d^4 + 2*(60*g^3*i^2*log(
e) + 17*g^3*i^2)*a^3*b^3*c*d^5)*B^2*x^2 - 6*(b^6*c^5*d*g^3*i^2 - 6*a*b^5*c^
4*d^2*g^3*i^2 + 15*a^2*b^4*c^3*d^3*g^3*i^2 - 6*a^4*b^2*c*d^5*g^3*i^2 + a^5*
b*d^6*g^3*i^2 - 5*(12*g^3*i^2*log(e) + g^3*i^2)*a^3*b^3*c^2*d^4)*B^2*x - (6
*a*b^5*c^5*d*g^3*i^2 - 33*a^2*b^4*c^4*d^2*g^3*i^2 + 74*a^3*b^3*c^3*d^3*g^3*
i^2 - 9*(10*g^3*i^2*log(e) + 7*g^3*i^2)*a^4*b^2*c^2*d^4 + 18*(2*g^3*i^2*log
(e) + g^3*i^2)*a^5*b*c*d^5 - 2*(3*g^3*i^2*log(e) + g^3*i^2)*a^6*d^6)*B^2)*l
og(b*x + a) - 2*(60*B^2*b^6*d^6*g^3*i^2*x^6*log(e) + 12*((12*g^3*i^2*log(e)
 - g^3*i^2)*b^6*c*d^5 + (18*g^3*i^2*log(e) + g^3*i^2)*a*b^5*d^6)*B^2*x^5 +
3*((30*g^3*i^2*log(e) - 7*g^3*i^2)*b^6*c^2*d^4 + 6*(30*g^3*i^2*log(e) - g^3
*i^2)*a*b^5*c*d^5 + (90*g^3*i^2*log(e) + 13*g^3*i^2)*a^2*b^4*d^6)*B^2*x^4 -
 2*(b^6*c^3*d^3*g^3*i^2 - 3*(60*g^3*i^2*log(e) - 13*g^3*i^2)*a*b^5*c^2*d^4
- 3*(120*g^3*i^2*log(e) + 7*g^3*i^2)*a^2*b^4*c*d^5 - (60*g^3*i^2*log(e) + 1
9*g^3*i^2)*a^3*b^3*d^6)*B^2*x^3 + 3*(b^6*c^4*d^2*g^3*i^2 - 6*a*b^5*c^3*d^3*
g^3*i^2 + a^4*b^2*d^6*g^3*i^2 + 30*(6*g^3*i^2*log(e) - g^3*i^2)*a^2*b^4*c^2
*d^4 + 2*(60*g^3*i^2*log(e) + 17*g^3*i^2)*a^3*b^3*c*d^5)*B^2*x^2 - 6*(b^6*c
^5*d*g^3*i^2 - 6*a*b^5*c^4*d^2*g^3*i^2 + 15*a^2*b^4*c^3*d^3*g^3*i^2 - 6*a^4
*b^2*c*d^5*g^3*i^2 + a^5*b*d^6*g^3*i^2 - 5*(12*g^3*i^2*log(e) + g^3*i^2)*a^
3*b^3*c^2*d^4)*B^2*x + 6*(10*B^2*b^6*d^6*g^3*i^2*x^6 + 60*B^2*a^3*b^3*c^2*d
^4*g^3*i^2*x + 12*(2*b^6*c*d^5*g^3*i^2 + 3*a*b^5*d^6*g^3*i^2)*B^2*x^5 + 15*
(b^6*c^2*d^4*g^3*i^2 + 6*a*b^5*c*d^5*g^3*i^2 + 3*a^2*b^4*d^6*g^3*i^2)*B^2*x
^4 + 20*(3*a*b^5*c^2*d^4*g^3*i^2 + 6*a^2*b^4*c*d^5*g^3*i^2 + a^3*b^3*d^6*g^
3*i^2)*B^2*x^3 + 30*(3*a^2*b^4*c^2*d^4*g^3*i^2 + 2*a^3*b^3*c*d^5*g^3*i^2)*B
^2*x^2 + (15*a^4*b^2*c^2*d^4*g^3*i^2 - 6*a^5*b*c*d^5*g^3*i^2 + a^6*d^6*g^3*
i^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^3*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3d^2g^3i^2x^5 + A^2a^3c^2g^3i^2 + \left(2\,A^2b^3cd + 3\,A^2ab^2d^2\right)g^3i^2x^4 + \left(A^2b^3c^2 + 6\,A^2ab^2cd + 3\,A^2a^2bd^2\right)g^3i^2x^3 + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] integral(A^2*b^3*d^2*g^3*i^2*x^5 + A^2*a^3*c^2*g^3*i^2 + (2*A^2*b^3*c*d + 3
```

```
*A^2*a*b^2*d^2)*g^3*i^2*x^4 + (A^2*b^3*c^2 + 6*A^2*a*b^2*c*d + 3*A^2*a^2*b*
d^2)*g^3*i^2*x^3 + (3*A^2*a*b^2*c^2 + 6*A^2*a^2*b*c*d + A^2*a^3*d^2)*g^3*i^
2*x^2 + (3*A^2*a^2*b*c^2 + 2*A^2*a^3*c*d)*g^3*i^2*x + (B^2*b^3*d^2*g^3*i^2*
x^5 + B^2*a^3*c^2*g^3*i^2 + (2*B^2*b^3*c*d + 3*B^2*a*b^2*d^2)*g^3*i^2*x^4 +
 (B^2*b^3*c^2 + 6*B^2*a*b^2*c*d + 3*B^2*a^2*b*d^2)*g^3*i^2*x^3 + (3*B^2*a*b
^2*c^2 + 6*B^2*a^2*b*c*d + B^2*a^3*d^2)*g^3*i^2*x^2 + (3*B^2*a^2*b*c^2 + 2*
B^2*a^3*c*d)*g^3*i^2*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*d^2*g^3
*i^2*x^5 + A*B*a^3*c^2*g^3*i^2 + (2*A*B*b^3*c*d + 3*A*B*a*b^2*d^2)*g^3*i^2*
x^4 + (A*B*b^3*c^2 + 6*A*B*a*b^2*c*d + 3*A*B*a^2*b*d^2)*g^3*i^2*x^3 + (3*A*
B*a*b^2*c^2 + 6*A*B*a^2*b*c*d + A*B*a^3*d^2)*g^3*i^2*x^2 + (3*A*B*a^2*b*c^2
 + 2*A*B*a^3*c*d)*g^3*i^2*x)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 (dix + ci)^2 \left(B \log\left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

3.65 $\int (ag+bgx)^2(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=761

$$\frac{B^2g^2i^2(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{15b^3d^3}+\frac{Bg^2i^2(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+3B\right)}{30b^3d^3}+\frac{Bg^2i^2(a+bx)(bc$$

```
[Out] -(B^2*(b*c - a*d)^4*g^2*i^2*x)/(10*b^2*d^2) - (B^2*(b*c - a*d)^3*g^2*i^2*(c
 + d*x)^2)/(20*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3)/(30*d^3) +
(B^2*(b*c - a*d)^5*g^2*i^2*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) - (B*(b*c
 - a*d)^3*g^2*i^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^3
*d) - (B*(b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(15*b^3) - (B*(b*c - a*d)^3*g^2*i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(5*b*d^3) + (4*B*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) - (b*B*(b*c - a*d)*g^2*i^2*(c + d*x
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*d^3) + ((b*c - a*d)^2*g^2*i^2
*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(30*b^3) + ((b*c - a*d
)*g^2*i^2*(a + b*x)^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(10
*b^2) + (g^2*i^2*(a + b*x)^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
])^2)/(5*b) + (B*(b*c - a*d)^4*g^2*i^2*(a + b*x)*(2*A + B + 2*B*Log[(e*(a +
 b*x))/(c + d*x)]))/(30*b^3*d^2) + (B*(b*c - a*d)^5*g^2*i^2*Log[(b*c - a*d)
/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^3*d^3
) + (B^2*(b*c - a*d)^5*g^2*i^2*Log[c + d*x])/(10*b^3*d^3) + (B^2*(b*c - a*d
)^5*g^2*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(15*b^3*d^3)
```

Rubi [A] time = 2.39625, antiderivative size = 666, normalized size of antiderivative = 0.88, number of steps used = 74, number of rules used = 13, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^2i^2(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{15b^3d^3}-\frac{Bg^2i^2(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{15b^3d^3}+\frac{d^2g^2i^2(a+bx)^5\left(B\log\left(\frac{e(a}{c}\right.\right.}{5b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,
x]
```

```
[Out] (A*B*(b*c - a*d)^4*g^2*i^2*x)/(15*b^2*d^2) - (B^2*(b*c - a*d)^4*g^2*i^2*x)/
(15*b^2*d^2) + (B^2*(b*c - a*d)^3*g^2*i^2*(a + b*x)^2)/(20*b^3*d) + (B^2*(b
*c - a*d)^2*g^2*i^2*(a + b*x)^3)/(30*b^3) + (B^2*(b*c - a*d)^4*g^2*i^2*(a +
 b*x)*Log[(e*(a + b*x))/(c + d*x)])/(15*b^3*d^2) - (B*(b*c - a*d)^3*g^2*i^2
*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^3*d) - (B*(b*c - a
*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b^3) - (
B*d*(b*c - a*d)*g^2*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
10*b^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)])^2)/(3*b^3) + (d*(b*c - a*d)*g^2*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(2*b^3) + (d^2*g^2*i^2*(a + b*x)^5*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(5*b^3) + (B^2*(b*c - a*d)^5*g^2*i^2*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x])/(15*b^3*d^3) - (B*(b*c - a*d)^5*g^2*i^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(15*b^3*d^3) - (B^2*(b*c - a*
d)^5*g^2*i^2*Log[c + d*x]^2)/(30*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(15*b^3*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (65c+65dx)^2(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx = \int\left(\frac{(-bc+ad)^2g^2(65c+65dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} - \frac{2b(\cdots}{\cdots}\right.$$

$$= \frac{\left(b^2g^2\right)\int (65c+65dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{4225d^2} - \frac{\left(2b(bc-\cdots\right.}{\cdots}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d^3} - \frac{4225b(bc\cdots}{\cdots}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d^3} - \frac{4225b(bc\cdots}{\cdots}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d^3} - \frac{4225b(bc\cdots}{\cdots}$$

$$= \frac{4225(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d^3} - \frac{4225b(bc\cdots}{\cdots}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B(bc-ad)^3g^2(c+dx)^2\left(A+B\,\mathrm{l}\cdots\right.}{6bd^3}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g^2(a+bx)\log\left(\frac{e(a+\cdots}{c+\cdots}\right.}{3b^3d^2}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g^2(a+bx)\log\left(\frac{e(a+\cdots}{c+\cdots}\right.}{3b^3d^2}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-\cdots}{4\cdots}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-\cdots}{4\cdots}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-\cdots}{4\cdots}$$

$$= -\frac{845AB(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-ad)^4g^2x}{3b^2d^2} - \frac{845B^2(bc-\cdots}{4\cdots}$$

<u>Mathematica</u> [A] time = 0.913887, size = 1194, normalized size = 1.57

$$\frac{g^2i^2\left(12d^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(a+bx)^5+30d^4(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(a+bx)^4+20d^3(bc-ad)^2\left(A+B\log\left(\cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^2*i^2*(20*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^2 + 30*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2 + 12*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 20*B*(b*c
```

```
 - a*d)^3*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a +
b*x))/(c + d*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2
*B*(b*c - a*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])*Log[c + d*x] + B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]
) + B*(b*c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*L
og[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) - 10*B*(b*c - a*d)^
2*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x)
)/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b
*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 -
2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*L
og[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B*(b
*c - a*d)*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e
*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24
*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x - d^2*(a +
 b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*(b*c - a*d)^
2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^
3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Log[c + d*x])
+ 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*
Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(60*b^3*d^3)
```

Maple [F] time = 2.686, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2} (dix+ci)^{2} \left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.97522, size = 4936, normalized size = 6.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")
```

```
[Out] 1/5*A^2*b^2*d^2*g^2*i^2*x^5 + 1/2*A^2*b^2*c*d*g^2*i^2*x^4 + 1/2*A^2*a*b*d^2
*g^2*i^2*x^4 + 1/3*A^2*b^2*c^2*g^2*i^2*x^3 + 4/3*A^2*a*b*c*d*g^2*i^2*x^3 +
1/3*A^2*a^2*d^2*g^2*i^2*x^3 + A^2*a*b*c^2*g^2*i^2*x^2 + A^2*a^2*c*d*g^2*i^2
*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log
(d*x + c)/d)*A*B*a^2*c^2*g^2*i^2 + 2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x +
c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*
B*a*b*c^2*g^2*i^2 + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3
*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(
```

```
b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*c^2*g^2*i^2 + 2*(x^2*log(b*e*x/(d*
x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*
c - a*d)*x/(b*d))*A*B*a^2*c*d*g^2*i^2 + 4/3*(2*x^3*log(b*e*x/(d*x + c) + a*
e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d
- a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b*c*d*g^2*i^2 +
1/6*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 +
6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^
2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^2*c*d*g^2*i^2 + 1/
3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*
c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/
(b^2*d^2))*A*B*a^2*d^2*g^2*i^2 + 1/6*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a
*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b
^3*d^3))*A*B*a*b*d^2*g^2*i^2 + 1/30*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 -
 a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*
d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^2*d^2*g^2*i^2 + A^2*a
^2*c^2*g^2*i^2*x - 1/30*(2*b^4*c^5*g^2*i^2*log(e) + 9*a^3*b*c^2*d^3*g^2*i^2
 - 2*a^4*c*d^4*g^2*i^2 - 2*(5*g^2*i^2*log(e) - g^2*i^2)*a*b^3*c^4*d + (20*g
^2*i^2*log(e) - 9*g^2*i^2)*a^2*b^2*c^3*d^2)*B^2*log(d*x + c)/(b^2*d^3) - 1/
15*(b^5*c^5*g^2*i^2 - 5*a*b^4*c^4*d*g^2*i^2 + 10*a^2*b^3*c^3*d^2*g^2*i^2 -
10*a^3*b^2*c^2*d^3*g^2*i^2 + 5*a^4*b*c*d^4*g^2*i^2 - a^5*d^5*g^2*i^2)*(log(
b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a
*d)))*B^2/(b^3*d^3) + 1/60*(12*B^2*b^5*d^5*g^2*i^2*x^5*log(e)^2 + 6*((5*g^2
*i^2*log(e)^2 - g^2*i^2*log(e))*b^5*c*d^4 + (5*g^2*i^2*log(e)^2 + g^2*i^2*l
og(e))*a*b^4*d^5)*B^2*x^4 + 2*((10*g^2*i^2*log(e)^2 - 6*g^2*i^2*log(e) + g^
2*i^2)*b^5*c^2*d^3 + 2*(20*g^2*i^2*log(e)^2 - g^2*i^2)*a*b^4*c*d^4 + (10*g^
2*i^2*log(e)^2 + 6*g^2*i^2*log(e) + g^2*i^2)*a^2*b^3*d^5)*B^2*x^3 - ((2*g^2
*i^2*log(e) - 3*g^2*i^2)*b^5*c^3*d^2 - 3*(20*g^2*i^2*log(e)^2 - 10*g^2*i^2*
log(e) - g^2*i^2)*a*b^4*c^2*d^3 - 3*(20*g^2*i^2*log(e)^2 + 10*g^2*i^2*log(e
) - g^2*i^2)*a^2*b^3*c*d^4 - (2*g^2*i^2*log(e) + 3*g^2*i^2)*a^3*b^2*d^5)*B^
2*x^2 + 2*(2*(g^2*i^2*log(e) - g^2*i^2)*b^5*c^4*d - (10*g^2*i^2*log(e) - 11
*g^2*i^2)*a*b^4*c^3*d^2 + 6*(5*g^2*i^2*log(e)^2 - 3*g^2*i^2)*a^2*b^3*c^2*d^
3 + (10*g^2*i^2*log(e) + 11*g^2*i^2)*a^3*b^2*c*d^4 - 2*(g^2*i^2*log(e) + g^
2*i^2)*a^4*b*d^5)*B^2*x + 2*(6*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2
*d^3*g^2*i^2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b
^5*c^2*d^3*g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 +
 30*(a*b^4*c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i^2)*B^2*x^2 + (10*a^3*b^2*c
^2*d^3*g^2*i^2 - 5*a^4*b*c*d^4*g^2*i^2 + a^5*d^5*g^2*i^2)*B^2)*log(b*x + a)
^2 + 2*(6*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(
b^5*c*d^4*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2*i^2 +
4*a*b^4*c*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^
2*i^2 + a^2*b^3*c*d^4*g^2*i^2)*B^2*x^2 + (b^5*c^5*g^2*i^2 - 5*a*b^4*c^4*d*g
^2*i^2 + 10*a^2*b^3*c^3*d^2*g^2*i^2)*B^2)*log(d*x + c)^2 + 2*(12*B^2*b^5*d^
5*g^2*i^2*x^5*log(e) + 3*((10*g^2*i^2*log(e) - g^2*i^2)*b^5*c*d^4 + (10*g^2
*i^2*log(e) + g^2*i^2)*a*b^4*d^5)*B^2*x^4 + 2*(40*a*b^4*c*d^4*g^2*i^2*log(e
) + (10*g^2*i^2*log(e) - 3*g^2*i^2)*b^5*c^2*d^3 + (10*g^2*i^2*log(e) + 3*g^
2*i^2)*a^2*b^3*d^5)*B^2*x^3 - (b^5*c^3*d^2*g^2*i^2 - a^3*b^2*d^5*g^2*i^2 -
15*(4*g^2*i^2*log(e) - g^2*i^2)*a*b^4*c^2*d^3 - 15*(4*g^2*i^2*log(e) + g^2*
i^2)*a^2*b^3*c*d^4)*B^2*x^2 + 2*(30*a^2*b^3*c^2*d^3*g^2*i^2*log(e) + b^5*c^
4*d*g^2*i^2 - 5*a*b^4*c^3*d^2*g^2*i^2 + 5*a^3*b^2*c*d^4*g^2*i^2 - a^4*b*d^5
*g^2*i^2)*B^2*x + (2*a^5*d^5*g^2*i^2*log(e) + 2*a*b^4*c^4*d*g^2*i^2 - 9*a^2
*b^3*c^3*d^2*g^2*i^2 + (20*g^2*i^2*log(e) + 9*g^2*i^2)*a^3*b^2*c^2*d^3 - 2*
(5*g^2*i^2*log(e) + g^2*i^2)*a^4*b*c*d^4)*B^2)*log(b*x + a) - 2*(12*B^2*b^5
*d^5*g^2*i^2*x^5*log(e) + 3*((10*g^2*i^2*log(e) - g^2*i^2)*b^5*c*d^4 + (10*
g^2*i^2*log(e) + g^2*i^2)*a*b^4*d^5)*B^2*x^4 + 2*(40*a*b^4*c*d^4*g^2*i^2*lo
g(e) + (10*g^2*i^2*log(e) - 3*g^2*i^2)*b^5*c^2*d^3 + (10*g^2*i^2*log(e) + 3
*g^2*i^2)*a^2*b^3*d^5)*B^2*x^3 - (b^5*c^3*d^2*g^2*i^2 - a^3*b^2*d^5*g^2*i^2
 - 15*(4*g^2*i^2*log(e) - g^2*i^2)*a*b^4*c^2*d^3 - 15*(4*g^2*i^2*log(e) + g
```

```
^2*i^2)*a^2*b^3*c*d^4)*B^2*x^2 + 2*(30*a^2*b^3*c^2*d^3*g^2*i^2*log(e) + b^5
*c^4*d*g^2*i^2 - 5*a*b^4*c^3*d^2*g^2*i^2 + 5*a^3*b^2*c*d^4*g^2*i^2 - a^4*b*
d^5*g^2*i^2)*B^2*x + 2*(6*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*
g^2*i^2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^
2*d^3*g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(
a*b^4*c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i^2)*B^2*x^2 + (10*a^3*b^2*c^2*d^
3*g^2*i^2 - 5*a^4*b*c*d^4*g^2*i^2 + a^5*d^5*g^2*i^2)*B^2)*log(b*x + a))*log
(d*x + c))/(b^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2d^2g^2i^2x^4 + A^2a^2c^2g^2i^2 + 2\left(A^2b^2cd + A^2abd^2\right)g^2i^2x^3 + \left(A^2b^2c^2 + 4\,A^2abcd + A^2a^2d^2\right)g^2i^2x^2 + 2\left(A^2a\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] integral(A^2*b^2*d^2*g^2*i^2*x^4 + A^2*a^2*c^2*g^2*i^2 + 2*(A^2*b^2*c*d + A
^2*a*b*d^2)*g^2*i^2*x^3 + (A^2*b^2*c^2 + 4*A^2*a*b*c*d + A^2*a^2*d^2)*g^2*i
^2*x^2 + 2*(A^2*a*b*c^2 + A^2*a^2*c*d)*g^2*i^2*x + (B^2*b^2*d^2*g^2*i^2*x^4
 + B^2*a^2*c^2*g^2*i^2 + 2*(B^2*b^2*c*d + B^2*a*b*d^2)*g^2*i^2*x^3 + (B^2*b
^2*c^2 + 4*B^2*a*b*c*d + B^2*a^2*d^2)*g^2*i^2*x^2 + 2*(B^2*a*b*c^2 + B^2*a^
2*c*d)*g^2*i^2*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^2*d^2*g^2*i^2*x
^4 + A*B*a^2*c^2*g^2*i^2 + 2*(A*B*b^2*c*d + A*B*a*b*d^2)*g^2*i^2*x^3 + (A*B
*b^2*c^2 + 4*A*B*a*b*c*d + A*B*a^2*d^2)*g^2*i^2*x^2 + 2*(A*B*a*b*c^2 + A*B*
a^2*c*d)*g^2*i^2*x)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^2 (dix + ci)^2 \left(B \log\left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

3.66 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=589

$$-\frac{B^2gi^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{6b^3d^2}-\frac{Bgi^2(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{6b^3d^2}-\frac{Bgi^2(a+bx)(bc-ad)^3\left(\right.}{6b^3d}$$

```
[Out] (B^2*(b*c - a*d)^3*g*i^2*x)/(12*b^2*d) + (B^2*(b*c - a*d)^2*g*i^2*(c + d*x)
^2)/(12*b*d^2) - (B^2*(b*c - a*d)^4*g*i^2*Log[(a + b*x)/(c + d*x)])/(12*b^3
*d^2) - (B*(b*c - a*d)^3*g*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(6*b^3*d) - (B*(b*c - a*d)^2*g*i^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(6*b^3) + (B*(b*c - a*d)^2*g*i^2*(c + d*x)^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(4*b*d^2) - (B*(b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(6*d^2) + ((b*c - a*d)^2*g*i^2*(a + b*x)^2*(A
 + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(12*b^3) + ((b*c - a*d)*g*i^2*(a + b*
x)^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*b^2) + (g*i^2*(a
+ b*x)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b) - (B*(b*
c - a*d)^4*g*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(6*b^3*d^2) - (B^2*(b*c - a*d)^4*g*i^2*Log[c + d*x])/(4*b^3*
d^2) - (B^2*(b*c - a*d)^4*g*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(6
*b^3*d^2)
```

Rubi [A] time = 1.58651, antiderivative size = 570, normalized size of antiderivative = 0.97, number of steps used = 46, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2gi^2(bc-ad)^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{6b^3d^2}+\frac{Bgi^2(bc-ad)^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{6b^3d^2}+\frac{ABgi^2x(bc-ad)^3}{6b^2d}+\frac{Bgi^2(c+}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (A*B*(b*c - a*d)^3*g*i^2*x)/(6*b^2*d) + (B^2*(b*c - a*d)^3*g*i^2*x)/(12*b^2
*d) + (B^2*(b*c - a*d)^2*g*i^2*(c + d*x)^2)/(12*b*d^2) + (B^2*(b*c - a*d)^4
*g*i^2*Log[a + b*x])/(12*b^3*d^2) - (B^2*(b*c - a*d)^4*g*i^2*Log[a + b*x]^2
)/(12*b^3*d^2) + (B^2*(b*c - a*d)^3*g*i^2*(a + b*x)*Log[(e*(a + b*x))/(c +
d*x)])/(6*b^3*d) + (B*(b*c - a*d)^2*g*i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(12*b*d^2) - (B*(b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(6*d^2) + (B*(b*c - a*d)^4*g*i^2*Log[a + b*x]*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b^3*d^2) - ((b*c - a*d)*g*i^2*(c + d*
x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*d^2) + (b*g*i^2*(c + d*x)^4
*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*d^2) - (B^2*(b*c - a*d)^4*g*i^2
*Log[c + d*x])/(6*b^3*d^2) + (B^2*(b*c - a*d)^4*g*i^2*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(6*b^3*d^2) + (B^2*(b*c - a*d)^4*g*i^2*PolyLog[2, -
((d*(a + b*x))/(b*c - a*d))])/(6*b^3*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (66c+66dx)^2(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int \left(\frac{(-bc+ad)g(66c+66dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} + \frac{bg(\cdots}{\cdots}\right.$$

$$= \frac{(bg)\int (66c+66dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{66d} + \frac{((-bc+a\cdots}{\cdots}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{1089bg\cdots}{\cdots}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{1089bg\cdots}{\cdots}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{1089bg\cdots}{\cdots}$$

$$= -\frac{1452(bc-ad)g(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{1089bg\cdots}{\cdots}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B(bc-ad)^2g(c+dx)^2\left(A+B\log\cdots\right.}{bd^2}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{726B^2(bc-ad)^3g(a+bx)\log\left(\frac{e(a+b\cdots}{c+dx}\right.}{b^3d}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{726B^2(bc-ad)^3g(a+bx)\log\left(\frac{e(a+b\cdots}{c+dx}\right.}{b^3d}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-a\cdots}{bd\cdots}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-a\cdots}{bd\cdots}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-a\cdots}{bd\cdots}$$

$$= \frac{726AB(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-ad)^3gx}{b^2d} + \frac{363B^2(bc-a\cdots}{bd\cdots}$$

Mathematica [A] time = 0.569135, size = 677, normalized size = 1.15

$$gi^2\left(\frac{4B(bc-ad)^2\left(-B(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+b^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2(bc-ad)^2\log(a+bx)\left(B\log\left(\frac{e(\cdots}{c\cdots}\right.\right.\right.}{b^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g*i^2*(-4*(b*c - a*d)*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
 3*b*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (4*B*(b*c - a*d)^
2*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*(b*d*x + (b*c - a*d)*Log[a + b*x])
```

```
 + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*(c + d*x)
^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c - a*d)^2*Log[a + b*x]*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a*d)^2*Log[c + d*x] - B*(b*c
- a*d)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3 - (B*(b*c - a*d)*(6*A*b*d
*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a + b*x]) - B
*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a
 + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 3*b
^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b^3*(c
+ d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c + d*x] - 3
*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a
*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3))/(12*d^2)
```

Maple [F] time = 2.291, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)(dix+ci)^2\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.80073, size = 3050, normalized size = 5.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] 1/4*A^2*b*d^2*g*i^2*x^4 + 2/3*A^2*b*c*d*g*i^2*x^3 + 1/3*A^2*a*d^2*g*i^2*x^3
 + 1/2*A^2*b*c^2*g*i^2*x^2 + A^2*a*c*d*g*i^2*x^2 + 2*(x*log(b*e*x/(d*x + c)
 + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a*c^2*g*i^2 +
(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(
d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*b*c^2*g*i^2 + 2*(x^2*log(b*e*x/(d*x
 + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c
 - a*d)*x/(b*d))*A*B*a*c*d*g*i^2 + 2/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*
x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b
*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b*c*d*g*i^2 + 1/3*(2*x^
3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log
(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^
2))*A*B*a*d^2*g*i^2 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*
a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*
x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A
*B*b*d^2*g*i^2 + A^2*a*c^2*g*i^2*x - 1/12*(7*a^2*b*c^2*d^2*g*i^2 - 2*a^3*c*
d^3*g*i^2 - (2*g*i^2*log(e) - g*i^2)*b^3*c^4 + 2*(4*g*i^2*log(e) - 3*g*i^2)
*a*b^2*c^3*d)*B^2*log(d*x + c)/(b^2*d^2) + 1/6*(b^4*c^4*g*i^2 - 4*a*b^3*c^3
*d*g*i^2 + 6*a^2*b^2*c^2*d^2*g*i^2 - 4*a^3*b*c*d^3*g*i^2 + a^4*d^4*g*i^2)*(
log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c
 - a*d)))*B^2/(b^3*d^2) + 1/12*(3*B^2*b^4*d^4*g*i^2*x^4*log(e)^2 + 2*((4*g*
```

```
i^2*log(e)^2 - g*i^2*log(e))*b^4*c*d^3 + (2*g*i^2*log(e)^2 + g*i^2*log(e))*
a*b^3*d^4)*B^2*x^3 + ((6*g*i^2*log(e)^2 - 5*g*i^2*log(e) + g*i^2)*b^4*c^2*d
^2 + 2*(6*g*i^2*log(e)^2 + 2*g*i^2*log(e) - g*i^2)*a*b^3*c*d^3 + (g*i^2*log
(e) + g*i^2)*a^2*b^2*d^4)*B^2*x^2 - ((2*g*i^2*log(e) - 3*g*i^2)*b^4*c^3*d -
 (12*g*i^2*log(e)^2 - 4*g*i^2*log(e) - 7*g*i^2)*a*b^3*c^2*d^2 - (8*g*i^2*lo
g(e) + 5*g*i^2)*a^2*b^2*c*d^3 + (2*g*i^2*log(e) + g*i^2)*a^3*b*d^4)*B^2*x +
 (3*B^2*b^4*d^4*g*i^2*x^4 + 12*B^2*a*b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g
*i^2 + a*b^3*d^4*g*i^2)*B^2*x^3 + 6*(b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^
2)*B^2*x^2 + (6*a^2*b^2*c^2*d^2*g*i^2 - 4*a^3*b*c*d^3*g*i^2 + a^4*d^4*g*i^2
)*B^2)*log(b*x + a)^2 + (3*B^2*b^4*d^4*g*i^2*x^4 + 12*B^2*a*b^3*c^2*d^2*g*i
^2*x + 4*(2*b^4*c*d^3*g*i^2 + a*b^3*d^4*g*i^2)*B^2*x^3 + 6*(b^4*c^2*d^2*g*i
^2 + 2*a*b^3*c*d^3*g*i^2)*B^2*x^2 - (b^4*c^4*g*i^2 - 4*a*b^3*c^3*d*g*i^2)*B
^2)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g*i^2*x^4*log(e) + 2*((8*g*i^2*log(e) -
 g*i^2)*b^4*c*d^3 + (4*g*i^2*log(e) + g*i^2)*a*b^3*d^4)*B^2*x^3 + (a^2*b^2*
d^4*g*i^2 + (12*g*i^2*log(e) - 5*g*i^2)*b^4*c^2*d^2 + 4*(6*g*i^2*log(e) + g
*i^2)*a*b^3*c*d^3)*B^2*x^2 - 2*(b^4*c^3*d*g*i^2 - 4*a^2*b^2*c*d^3*g*i^2 + a
^3*b*d^4*g*i^2 - 2*(6*g*i^2*log(e) - g*i^2)*a*b^3*c^2*d^2)*B^2*x - (2*a*b^3
*c^3*d*g*i^2 - (12*g*i^2*log(e) + g*i^2)*a^2*b^2*c^2*d^2 + 2*(4*g*i^2*log(e
) - g*i^2)*a^3*b*c*d^3 - (2*g*i^2*log(e) - g*i^2)*a^4*d^4)*B^2)*log(b*x + a
) - (6*B^2*b^4*d^4*g*i^2*x^4*log(e) + 2*((8*g*i^2*log(e) - g*i^2)*b^4*c*d^3
 + (4*g*i^2*log(e) + g*i^2)*a*b^3*d^4)*B^2*x^3 + (a^2*b^2*d^4*g*i^2 + (12*g
*i^2*log(e) - 5*g*i^2)*b^4*c^2*d^2 + 4*(6*g*i^2*log(e) + g*i^2)*a*b^3*c*d^3
)*B^2*x^2 - 2*(b^4*c^3*d*g*i^2 - 4*a^2*b^2*c*d^3*g*i^2 + a^3*b*d^4*g*i^2 -
2*(6*g*i^2*log(e) - g*i^2)*a*b^3*c^2*d^2)*B^2*x + 2*(3*B^2*b^4*d^4*g*i^2*x^
4 + 12*B^2*a*b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g*i^2 + a*b^3*d^4*g*i^2)*
B^2*x^3 + 6*(b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^2)*B^2*x^2 + (6*a^2*b^2*
c^2*d^2*g*i^2 - 4*a^3*b*c*d^3*g*i^2 + a^4*d^4*g*i^2)*B^2)*log(b*x + a))*log
(d*x + c))/(b^3*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bd^2gi^2x^3 + A^2ac^2gi^2 + \left(2\,A^2bcd + A^2ad^2\right)gi^2x^2 + \left(A^2bc^2 + 2\,A^2acd\right)gi^2x + \left(B^2bd^2gi^2x^3 + B^2ac^2gi^2 + \left(2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] integral(A^2*b*d^2*g*i^2*x^3 + A^2*a*c^2*g*i^2 + (2*A^2*b*c*d + A^2*a*d^2)*
g*i^2*x^2 + (A^2*b*c^2 + 2*A^2*a*c*d)*g*i^2*x + (B^2*b*d^2*g*i^2*x^3 + B^2*
a*c^2*g*i^2 + (2*B^2*b*c*d + B^2*a*d^2)*g*i^2*x^2 + (B^2*b*c^2 + 2*B^2*a*c*
d)*g*i^2*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b*d^2*g*i^2*x^3 + A*B*a
*c^2*g*i^2 + (2*A*B*b*c*d + A*B*a*d^2)*g*i^2*x^2 + (A*B*b*c^2 + 2*A*B*a*c*d
)*g*i^2*x)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^2 \left(B \log \left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

3.67 $\int (ci+dix)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=334

$$-\frac{2B^2i^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{3b^3d}+\frac{2Bi^2(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3d}-\frac{2Bi^2(a+bx)(bc-ad)}{3}$$

```
[Out] (B^2*(b*c - a*d)^2*i^2*x)/(3*b^2) + (B^2*(b*c - a*d)^3*i^2*Log[(a + b*x)/(c
 + d*x)])/(3*b^3*d) - (2*B*(b*c - a*d)^2*i^2*(a + b*x)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(3*b^3) - (B*(b*c - a*d)*i^2*(c + d*x)^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(3*b*d) + (i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2)/(3*d) + (B^2*(b*c - a*d)^3*i^2*Log[c + d*x])/(b^3*d) + (2*B*(
b*c - a*d)^3*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))
/(d*(a + b*x))])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*PolyLog[2, (b*(c + d*
x))/(d*(a + b*x))])/(3*b^3*d)
```

Rubi [A] time = 0.53155, antiderivative size = 420, normalized size of antiderivative = 1.26, number of steps used = 20, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{2B^2i^2(bc-ad)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3d}-\frac{2Bi^2(bc-ad)^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3d}-\frac{2ABi^2x(bc-ad)^2}{3b^2}-\frac{Bi^2(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^2*i^2*x)/(3*b^2) + (B^2*(b*c - a*d)^2*i^2*x)/(3*b^2) +
(B^2*(b*c - a*d)^3*i^2*Log[a + b*x])/(3*b^3*d) + (B^2*(b*c - a*d)^3*i^2*Log
[a + b*x]^2)/(3*b^3*d) - (2*B^2*(b*c - a*d)^2*i^2*(a + b*x)*Log[(e*(a + b*x
))/(c + d*x)])/(3*b^3) - (B*(b*c - a*d)*i^2*(c + d*x)^2*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(3*b*d) - (2*B*(b*c - a*d)^3*i^2*Log[a + b*x]*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(3*b^3*d) + (i^2*(c + d*x)^3*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(3*d) + (2*B^2*(b*c - a*d)^3*i^2*Log[c + d*x])/(3*b^3
*d) - (2*B^2*(b*c - a*d)^3*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])
/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/(3*b^3*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (67c+67dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx = \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - \frac{(2B)\int \frac{300763(bc-ad)(c+dx)^2\left(A+B\log\right.}{a+bx}}{201d}$$

$$= \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - \frac{(8978B(bc-ad))\int \frac{(c+dx)^2\left(A+\right.}{a}}{3d}$$

$$= \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - \frac{(8978B(bc-ad))\int\left(\frac{d(bc-ad)(A}{}\right.}{}$$

$$= \frac{4489(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3d} - \frac{(8978B(bc-ad))\int(c+dx)\left(\right.}{3b}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{4489B(bc-ad)(c+dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{3bd}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{8978B^2(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{3b^3} - \frac{448}{}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{8978B^2(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{3b^3} - \frac{448}{}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3\log(}{3b^3d}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3\log(}{3b^3d}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3\log(}{3b^3d}$$

$$= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3\log(}{3b^3d}$$

Mathematica [A] time = 0.215564, size = 287, normalized size = 0.86

$$i^2\left((c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B(bc-ad)\left(-B(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+b^2(c+dx)^2\left(B\log\left(\frac{e(a}{c}\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i^2*((c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(
2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*(b*d*x + (b*c - a*d)*Log[a + b*x]) +
2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*(c + d*x)^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c - a*d)^2*Log[a + b*x]*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a*d)^2*Log[c + d*x] - B*(b*c - a
*d)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3))/(3*d)
```

Maple [F] time = 2.044, size = 0, normalized size = 0.

$$\int (dix+ci)^2 \left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^2 \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.81617, size = 1623, normalized size = 4.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*d^2*i^2*x^3 + A^2*c*d*i^2*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x
 + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*c^2*i^2 + 2*(x^2*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2
- (b*c - a*d)*x/(b*d))*A*B*c*d*i^2 + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(
d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a
*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*d^2*i^2 + A^2*c^2*i^2
*x - 1/3*(5*a*b*c^2*d*i^2 - 2*a^2*c*d^2*i^2 + (2*i^2*log(e) - 3*i^2)*b^2*c^
3)*B^2*log(d*x + c)/(b^2*d) - 2/3*(b^3*c^3*i^2 - 3*a*b^2*c^2*d*i^2 + 3*a^2*
b*c*d^2*i^2 - a^3*d^3*i^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1)
 + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d) + 1/3*(B^2*b^3*d^3*i^2*x^
3*log(e)^2 + (a*b^2*d^3*i^2*log(e) + (3*i^2*log(e)^2 - i^2*log(e))*b^3*c*d^
2)*B^2*x^2 + ((3*i^2*log(e)^2 - 4*i^2*log(e) + i^2)*b^3*c^2*d + 2*(3*i^2*lo
g(e) - i^2)*a*b^2*c*d^2 - (2*i^2*log(e) - i^2)*a^2*b*d^3)*B^2*x + (B^2*b^3*
d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + (3*a*b^2*c^
2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B^2)*log(b*x + a)^2 + (B^2*b^3*d
^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*
i^2)*log(d*x + c)^2 + (2*B^2*b^3*d^3*i^2*x^3*log(e) + (a*b^2*d^3*i^2 + (6*i
^2*log(e) - i^2)*b^3*c*d^2)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2
+ (3*i^2*log(e) - 2*i^2)*b^3*c^2*d)*B^2*x + (2*(3*i^2*log(e) - 2*i^2)*a*b^2
*c^2*d - (6*i^2*log(e) - 7*i^2)*a^2*b*c*d^2 + (2*i^2*log(e) - 3*i^2)*a^3*d^
3)*B^2)*log(b*x + a) - (2*B^2*b^3*d^3*i^2*x^3*log(e) + (a*b^2*d^3*i^2 + (6*
i^2*log(e) - i^2)*b^3*c*d^2)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2
 + (3*i^2*log(e) - 2*i^2)*b^3*c^2*d)*B^2*x + 2*(B^2*b^3*d^3*i^2*x^3 + 3*B^2
*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + (3*a*b^2*c^2*d*i^2 - 3*a^2*b*c
*d^2*i^2 + a^3*d^3*i^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^3*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(\frac{bex + ae}{dx + c}\right)^2 + 2\,\left(ABd^2i^2x^2 + 2\,ABcd\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^2
 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d
^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)^2\left(B\log\left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.68 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=535

$$\frac{2Bi^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g}+\frac{2B^2i^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g}-\frac{B^2i^2(bc-ad)^2\text{PolyLo}}{b^3g}$$

```
[Out] -((B*d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3
*g)) + (2*B*(b*c - a*d)^2*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(b^3*g) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[(
e*(a + b*x))/(c + d*x)])^2)/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(2*b*g) + (B^2*(b*c - a*d)^2*i^2*Log[c + d*x])/(b^3*g)
+ (B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c +
 d*x))/(d*(a + b*x))])/(b^3*g) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c
 - a*d)^2*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*g) - (B^2*(b*c
- a*d)^2*i^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B*(b*c -
 a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(
d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*PolyLog[3, (b*(c + d*x))/
(d*(a + b*x))])/(b^3*g)
```

Rubi [B] time = 5.1233, antiderivative size = 1676, normalized size of antiderivative = 3.13, number of steps used = 86, number of rules used = 27, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x),
x]
```

```
[Out] -((A*B*d*(b*c - a*d)*i^2*x)/(b^2*g)) - (a*B^2*d*(b*c - a*d)*i^2*Log[a + b*x
]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*Log[a + b*x]^2)/(2*b^3*g) - (A*B*(b*c
 - a*d)^2*i^2*Log[g*(a + b*x)]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*Log[g*(a
 + b*x)]^3)/(3*b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[a + b*x]^2*Log[-c - d*x]
)/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*Log[a + b*x]*Log[g*(a + b*x)]*Log[-c -
 d*x])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(
b^3*g) + (B^2*(b*c - a*d)^2*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c +
d*x)^(-1)]^2)/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[g*(a + b*x)]*Log[(c + d*
x)^(-1)]^2)/(b^3*g) - (B^2*d*(b*c - a*d)*i^2*(a + b*x)*Log[(e*(a + b*x))/(c
 + d*x)])/(b^3*g) + (2*a*B*d*(b*c - a*d)*i^2*Log[a + b*x]*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]))/(b^3*g) - (B*(b*c - a*d)^2*i^2*Log[a + b*x]*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(b^3*g) + (d*(b*c - a*d)*i^2*x*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/(b^2*g) + (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2)/(2*b*g) + (B^2*(b*c - a*d)^2*i^2*Log[c + d*x])/(b^3*g) + (2
*B^2*c*(b*c - a*d)*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2
*g) - (2*B*c*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d
*x])/(b^2*g) - (B^2*c*(b*c - a*d)*i^2*Log[c + d*x]^2)/(b^2*g) + (2*a*B^2*d*
(b*c - a*d)*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g) - (B^2
*(b*c - a*d)^2*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g) + (
B^2*(b*c - a*d)^2*i^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g
) + (B^2*(b*c - a*d)^2*i^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)
```

```
])/(b^3*g) + ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[
a*g + b*g*x])/(b^3*g) + (2*A*B*(b*c - a*d)^2*i^2*Log[(b*(c + d*x))/(b*c - a
*d)]*Log[a*g + b*g*x])/(b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*(Log[a + b*x] + L
og[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[(b*(c + d*x))/(b*c -
 a*d)]*Log[a*g + b*g*x])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[(e*(a + b*x))
/(c + d*x)]*Log[a*g + b*g*x]^2)/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[(b*(c
+ d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b^3*g) + (2*a*B^2*d*(b*c - a*d)*i
^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g) + (2*A*B*(b*c - a*d)^2
*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g) - (B^2*(b*c - a*d)^2
*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g) + (2*B^2*(b*c - a*d)
^2*i^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g) - (2*
B^2*(b*c - a*d)^2*i^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x
))/(c + d*x)])*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g) + (2*B^2*c
*(b*c - a*d)*i^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*g) - (2*B^2*(b
*c - a*d)^2*i^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/
(b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))]
)/(b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])
/(b^3*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
```

eQ[m, -1]

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rubi steps

$$\int \frac{(68c+68dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{4624d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{68d(68c+68dx)\left(A+B\log\right.}{bg}\right.$$

$$= \frac{\left(4624(bc-ad)^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx}{b^2} + \frac{(68d)\int(68c+68dx)\left(A+B\log\right.}{bg}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{bg}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{bg}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{bg}$$

$$= \frac{4624d(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g} + \frac{2312(c+dx)^2\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{bg}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} + \frac{9248aBd(bc-ad)\log(a+bx)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^3g}$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + 9248a$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + 9248a$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + 9248a$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624B^2d(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g} + 9248a$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + 2312B^2(bc-$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + 2312B^2(bc-$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + 2312B^2(bc-$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + 2312B^2(bc-$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + 2312B^2(bc-$$

$$= -\frac{4624ABd(bc-ad)x}{b^2g} - \frac{4624aB^2d(bc-ad)\log^2(a+bx)}{b^3g} + 2312B^2(bc-$$

Mathematica [B] time = 3.44435, size = 1987, normalized size = 3.71

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x),x]
```

```
[Out] (i^2*(12*A^2*b*d*(2*b*c - a*d)*x + 6*A^2*b^2*d^2*x^2 + 12*A^2*(b*c - a*d)^2
*Log[a + b*x] - 24*A*b*B*c*(a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b + x]*(1 + Lo
g[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c + a*d*Log[a + b*x] - a*d*
Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x) + a*d*Log[a + b*x])*Log[(e*(
a + b*x))/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 12*A
*b^2*B*c^2*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a/b + x] - Log[c/d + x] -
Log[(e*(a + b*x))/(c + d*x)]) - 2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) +
 a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 6*A*B*(-4*a*d^2*(a + b*x
)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2 + 4*a*b*d*(c + d*x)*(-1 +
Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*Log[a/b + x] - 2*a^2*Log[a
 + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[a + b*x])*(Log[a/b + x] - Lo
g[c/d + x] - Log[(e*(a + b*x))/(c + d*x)]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*
x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[c/d + x]*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 8*b*B^2
*c*(Log[(e*(a + b*x))/(c + d*x)]*(-(a*d*Log[(e*(a + b*x))/(c + d*x)]^2) + 6
*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(e*(a + b*x))/(c + d*
x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c - a*d + a*d*Log[
(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*a*d*P
olyLog[3, (d*(a + b*x))/(b*(c + d*x))]) + B^2*(4*a^2*d^2*Log[a/b + x]^3 - 1
2*a*d^2*(2*b*x - 2*(a + b*x)*Log[a/b + x] + (a + b*x)*Log[a/b + x]^2) - 3*d
^2*(b*x*(6*a - b*x) + (-6*a^2 - 4*a*b*x + 2*b^2*x^2)*Log[a/b + x] + 2*(a^2
- b^2*x^2)*Log[a/b + x]^2) - 12*a*b*d*(2*d*x - 2*(c + d*x)*Log[c/d + x] + (
c + d*x)*Log[c/d + x]^2) - 3*b^2*(d*x*(6*c - d*x) + (-6*c^2 - 4*c*d*x + 2*d
^2*x^2)*Log[c/d + x] + 2*(c^2 - d^2*x^2)*Log[c/d + x]^2) + 6*d^2*(b*x*(-2*a
 + b*x) + 2*a^2*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b
*x))/(c + d*x)])^2 - 6*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c
+ d*x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2
 + 4*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2
*Log[a/b + x] - 2*a^2*Log[a + b*x]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*x^2*Log
[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[c/d + x]*Log[(d*(a + b*x))
/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 6*(2*a*b*c*d +
 3*b^2*c*d*x + 3*a*b*d^2*x - b^2*d^2*x^2 - 2*a*b*d^2*x*Log[c/d + x] + b^2*d
^2*x^2*Log[c/d + x] - a^2*d^2*Log[a + b*x] - b^2*c^2*Log[c + d*x] - 2*a*b*c
*d*Log[c + d*x] - Log[a/b + x]*(b*d*(2*a*c + b*x*(2*c - d*x)) - 2*d^2*(a^2
- b^2*x^2)*Log[c/d + x] + (-2*b^2*c^2 + 2*a^2*d^2)*Log[(b*(c + d*x))/(b*c -
 a*d)]) + 2*(b^2*c^2 - a^2*d^2)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] +
4*a*d*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*Log[c + d*x] + Log[a/b + x]
*(-(d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b*c - a*d)*Log[(b*(c + d*x))
/(b*c - a*d)]) + (b*c - a*d)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*
a^2*d^2*(Log[a/b + x]^2*(Log[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2
*Log[a/b + x]*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a
 + b*x))/(-(b*c) + a*d)])) + 12*a^2*d^2*(Log[c/d + x]^2*Log[(d*(a + b*x))/(
-(b*c) + a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*P
olyLog[3, (b*(c + d*x))/(b*c - a*d)])) - 12*b^2*B^2*c^2*(Log[(-(b*c) + a*d)
/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*Log[(e*(a + b*x))/(c + d
*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*PolyLog[3, (b*(c + d*x))/(
d*(a + b*x))])))/(12*b^3*g)
```

Maple [F] time = 3.013, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{bgx + ag} \left(A + B \ln \left(\frac{e (bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="maxima")
```

```
[Out] 2*A^2*c*d*i^2*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/2*A^2*d^2*i^2*(2*a^2*l
og(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A^2*c^2*i^2*log(b*g*x + a*
g)/(b*g) + 1/2*(B^2*b^2*d^2*i^2*x^2 + 2*(2*b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x
 + 2*(b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B^2*log(b*x + a))*log(d*x
+ c)^2/(b^3*g) - integrate(-(B^2*b^3*c^3*i^2*log(e)^2 + 2*A*B*b^3*c^3*i^2*l
og(e) + (B^2*b^3*d^3*i^2*log(e)^2 + 2*A*B*b^3*d^3*i^2*log(e))*x^3 + 3*(B^2*
b^3*c*d^2*i^2*log(e)^2 + 2*A*B*b^3*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*d^3*i^2
*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*l
og(b*x + a)^2 + 3*(B^2*b^3*c^2*d*i^2*log(e)^2 + 2*A*B*b^3*c^2*d*i^2*log(e))
*x + 2*(B^2*b^3*c^3*i^2*log(e) + A*B*b^3*c^3*i^2 + (B^2*b^3*d^3*i^2*log(e)
+ A*B*b^3*d^3*i^2)*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e) + A*B*b^3*c*d^2*i^2)*x
^2 + 3*(B^2*b^3*c^2*d*i^2*log(e) + A*B*b^3*c^2*d*i^2)*x)*log(b*x + a) - (2*
B^2*b^3*c^3*i^2*log(e) + 2*A*B*b^3*c^3*i^2 + (2*A*B*b^3*d^3*i^2 + (2*i^2*lo
g(e) + i^2)*B^2*b^3*d^3)*x^3 + (6*A*B*b^3*c*d^2*i^2 - (a*b^2*d^3*i^2 - 2*(3
*i^2*log(e) + 2*i^2)*b^3*c*d^2)*B^2)*x^2 + 2*(3*A*B*b^3*c^2*d*i^2 + (3*b^3*
c^2*d*i^2*log(e) + 2*a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2)*B^2)*x + 2*(B^2*b^3*d
^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + (4*b^3*c^2*d*i^2 - 2*a*b^2*c*d^2*i^2
 + a^2*b*d^3*i^2)*B^2*x + (b^3*c^3*i^2 + a*b^2*c^2*d*i^2 - 2*a^2*b*c*d^2*i^
2 + a^3*d^3*i^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^4*d*g*x^2 + a*b^3*c*g
+ (b^4*c*g + a*b^3*d*g)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABd^2i^2x^2 + 2\,ABcdi^2x\right.}{bgx + ag}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^
2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*
```

```
d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/
(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
), x)
```

3.69 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=442

$$\frac{4Bdi^2(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^2}+\frac{2B^2di^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g^2}+\frac{4B^2di^2(bc-ad)\text{Po}}{b^3}$$

```
[Out] (-2*B^2*(b*c - a*d)*i^2*(c + d*x))/(b^2*g^2*(a + b*x)) - (2*B*(b*c - a*d)*i
^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g^2*(a + b*x)) + (2
*B*d*(b*c - a*d)*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(b^3*g^2) + (d^2*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])^2)/(b^3*g^2) - ((b*c - a*d)*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/
(c + d*x)])^2)/(b^2*g^2*(a + b*x)) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (2*
B^2*d*(b*c - a*d)*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*g^2) +
(4*B*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(
c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*PolyLog[3, (
b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2)
```

Rubi [B] time = 3.88662, antiderivative size = 1219, normalized size of antiderivative = 2.76, number of steps used = 65, number of rules used = 21, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$-\frac{aB^2d^2\log^2(a+bx)i^2}{b^3g^2}+\frac{B^2d(bc-ad)\log^2(a+bx)i^2}{b^3g^2}-\frac{2ABd(bc-ad)\log^2(a+bx)i^2}{b^3g^2}-\frac{2B^2d(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\text{l}}{b^3g^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^2)/(b^3*g^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)*i^2*L
og[a + b*x])/(b^3*g^2) - (a*B^2*d^2*i^2*Log[a + b*x]^2)/(b^3*g^2) - (2*A*B*
d*(b*c - a*d)*i^2*Log[a + b*x]^2)/(b^3*g^2) + (B^2*d*(b*c - a*d)*i^2*Log[a
+ b*x]^2)/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*Log[-((b*c - a*d)/(d*(a + b*
x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*
Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^2) - (2*B*(b*c - a*d)^2
*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2*(a + b*x)) + (2*a*B*d^2
*i^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2) - (2*B*d*
(b*c - a*d)*i^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2
) + (d^2*i^2*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^2*g^2) - ((b*c -
a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^2*(a + b*x)) + (2
*d*(b*c - a*d)*i^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^
3*g^2) + (2*B^2*d*(b*c - a*d)*i^2*Log[c + d*x])/(b^3*g^2) + (2*B^2*c*d*i^2*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*g^2) - (2*B^2*d*(b*c -
 a*d)*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^2) - (2*B*
c*d*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b^2*g^2) + (2*B
*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b^3*
g^2) - (B^2*c*d*i^2*Log[c + d*x]^2)/(b^2*g^2) + (B^2*d*(b*c - a*d)*i^2*Log[
c + d*x]^2)/(b^3*g^2) + (2*a*B^2*d^2*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*
c - a*d)])/(b^3*g^2) + (4*A*B*d*(b*c - a*d)*i^2*Log[a + b*x]*Log[(b*(c + d*
x))/(b*c - a*d)])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*Log[a + b*x]*Log[(b*
```

```
(c + d*x))/(b*c - a*d)])/(b^3*g^2) + (2*a*B^2*d^2*i^2*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))])/(b^3*g^2) + (4*A*B*d*(b*c - a*d)*i^2*PolyLog[2, -((d*(
a + b*x))/(b*c - a*d))])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(b^3*g^2) + (2*B^2*c*d*i^2*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])/(b^2*g^2) - (2*B^2*d*(b*c - a*d)*i^2*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*Log[(e*(a + b*x))
/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^2) + (4*B^2*d
*(b*c - a*d)*i^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(69c+69dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{4761d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} + \frac{4761(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^2g^2(a+bx)^2}\right.$$

$$= \frac{\left(4761d^2\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{b^2g^2} + \frac{(9522d(bc-ad))\int\frac{\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{a+bx}}{b^2g^2}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2(a+bx)}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2(a+bx)}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2(a+bx)}$$

$$= \frac{4761d^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^2} - \frac{4761(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2(a+bx)}$$

$$= -\frac{9522B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2(a+bx)} + \frac{9522aBd^2\log(a+bx)\left(A+B\right.}{b^3g^2}$$

$$= -\frac{9522B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^2(a+bx)} + \frac{9522aBd^2\log(a+bx)\left(A+B\right.}{b^3g^2}$$

$$= -\frac{9522B^2d(bc-ad)\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^2} - \frac{9522B(bc-ad)^2\left(A+B\right.}{b^3g^2(a+bx}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{9522B^2d(bc-ad}{}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{9522ABd(bc-ac}{b^3g}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{4761aB^2d^2\log^2(a}{b^3g^2}$$

$$= -\frac{9522B^2(bc-ad)^2}{b^3g^2(a+bx)} - \frac{9522B^2d(bc-ad)\log(a+bx)}{b^3g^2} - \frac{4761aB^2d^2\log^2(a}{b^3g^2}$$

Mathematica [B] time = 8.36429, size = 2652, normalized size = 6.

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^2,x]
```

```
[Out] (i^2*(3*A^2*b*d^2*x - (3*A^2*(b*c - a*d)^2)/(a + b*x) + 6*A^2*d*(b*c - a*d)
*Log[a + b*x] - (6*A*b^2*B*c^2*(-(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + (b*c - a*d)*(1 + Log[(e*(a + b*x))/(c +
d*x)])))/((b*c - a*d)*(a + b*x)) + (3*b^2*B^2*c^2*(-2*b*c + 2*a*d - 2*d*(a
+ b*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*d*(a +
 b*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - (b*c - a*d)*Log[(e*(a + b
*x))/(c + d*x)]^2 + 2*d*(a + b*x)*Log[c + d*x] - 2*d*(a + b*x)*Log[(e*(a +
b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(Log[a + b*x]
*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[
(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x)) + 6*A*b*B*c*d*(Lo
g[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2*Log[c/d + x]*Log[(d*(a + b*x
))/(-(b*c) + a*d)] + 2*Log[a + b*x]*((a*d)/(b*c - a*d) + Log[c/d + x] + Log
[(e*(a + b*x))/(c + d*x)]) + 2*a*((a + b*x)^(-1) + Log[(e*(a + b*x))/(c + d
*x)]/(a + b*x) + (d*Log[c + d*x])/(-(b*c) + a*d)) - 2*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)]) + 6*A*B*d^2*((a + b*x)*(-1 + Log[a/b + x]) - a*Log[a/b +
x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1 + Log[c/d + x])
 + (a^2*Log[c/d + x])/(a + b*x) + (b*x - a^2/(a + b*x) - 2*a*Log[a + b*x])*
(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)]) + (a^2*d*(Log
[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d) + 2*a*(Log[c/d + x]*Log[(d*(a + b
*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B^2*d^2*(6
*b*x - 6*(a + b*x)*Log[a/b + x] + 3*(a + b*x)*Log[a/b + x]^2 - 2*a*Log[a/b
+ x]^3 - (3*a^2*(2 + 2*Log[a/b + x] + Log[a/b + x]^2))/(a + b*x) + (3*b*(2*
d*x - 2*(c + d*x)*Log[c/d + x] + (c + d*x)*Log[c/d + x]^2))/d + 3*(b*x - a^
2/(a + b*x) - 2*a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a +
 b*x))/(c + d*x)])^2 - (6*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*Log[c +
 d*x] + Log[a/b + x]*(-(d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b*c - a*
d)*Log[(b*(c + d*x))/(b*c - a*d)]) + (b*c - a*d)*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)]))/d + (3*a^2*(d*(a + b*x)*Log[a/b + x]^2 + 2*((-(b*c) + a*d)
*Log[c/d + x] + d*(a + b*x)*(Log[a + b*x] - Log[c + d*x])) - 2*Log[a/b + x]
*((b*c - a*d)*Log[c/d + x] + d*(a + b*x)*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*d*(a + b*x)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/((-(b*c) + a*d)*(a
 + b*x)) + (3*a^2*(-(b*(c + d*x)*Log[c/d + x]^2) + 2*d*(a + b*x)*Log[c/d +
x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)]))/((b*c - a*d)*(a + b*x)) + 6*(-Log[a/b + x] + Log[c/d + x]
 + Log[(e*(a + b*x))/(c + d*x)])*((a + b*x)*(-1 + Log[a/b + x]) - a*Log[a/b
 + x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1 + Log[c/d +
x]) + (a^2*Log[c/d + x])/(a + b*x) + (a^2*d*(Log[a + b*x] - Log[c + d*x]))/
(-(b*c) + a*d) + 2*a*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])) + 6*a*(Log[a/b + x]^2*(Log[c/d + x] - L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)]) - 6*a*(Log[c/d
+ x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])) + (2*b*B^2
*c*d*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b*x) + 6*a*d
*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 - 6*b*c*Log[c/d
 + x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a/b + x]*Log[a
+ b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]*Log[a + b*x]
- 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d*(a + b*x))/(-
(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - (6*b
*(b*c - a*d)*x*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x) + 6*b*c*Log[a + b*x]
*Log[(e*(a + b*x))/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d
*x)] + 3*a*d*Log[(e*(a + b*x))/(c + d*x)]^2 + 3*b*d*x*Log[(e*(a + b*x))/(c
+ d*x)]^2 - (3*b^2*x*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^2)/(a + b*x) -
3*b*c*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2 - a*
d*Log[(e*(a + b*x))/(c + d*x)]^3 + 6*b*c*Log[(e*(a + b*x))/(c + d*x)]*Log[(
b*c - a*d)/(b*c + b*d*x)] - 6*a*d*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a
*d)/(b*c + b*d*x)] + 3*a*d*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(
```

```
b*c + b*d*x)] + 6*(b*c - a*d + a*d*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))] - 6*(b*c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)] + 6*b*c*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(
a + b*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 6*b*c*PolyLog[
3, (b*(c + d*x))/(d*(a + b*x))]))/(b*c - a*d)))/(3*b^3*g^2)
```

Maple [F] time = 3.704, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{(bgx+ag)^2}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="maxima")
```

```
[Out] -A^2*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2
))*d^2*i^2 + 2*A^2*c*d*i^2*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g
^2)) - 2*A*B*c^2*i^2*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b
*g^2) + 1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*
log(d*x + c)/((b^2*c - a*b*d)*g^2)) - A^2*c^2*i^2/(b^2*g^2*x + a*b*g^2) + (
B^2*b^2*d^2*i^2*x^2 + B^2*a*b*d^2*i^2*x - (b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^
2*d^2*i^2)*B^2 + 2*((b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + (a*b*c*d*i^2 - a^2*
d^2*i^2)*B^2)*log(b*x + a))*log(d*x + c)^2/(b^4*g^2*x + a*b^3*g^2) - integr
ate(-(B^2*b^3*c^3*i^2*log(e)^2 + (B^2*b^3*d^3*i^2*log(e)^2 + 2*A*B*b^3*d^3*
i^2*log(e))*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A*B*b^3*c*d^2*i^2*log(e
))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i
^2*x + B^2*b^3*c^3*i^2)*log(b*x + a)^2 + (3*B^2*b^3*c^2*d*i^2*log(e)^2 + 4*
A*B*b^3*c^2*d*i^2*log(e))*x + 2*(B^2*b^3*c^3*i^2*log(e) + (B^2*b^3*d^3*i^2*
log(e) + A*B*b^3*d^3*i^2)*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e) + A*B*b^3*c*d^2
*i^2)*x^2 + (3*B^2*b^3*c^2*d*i^2*log(e) + 2*A*B*b^3*c^2*d*i^2)*x)*log(b*x +
 a) - 2*((A*B*b^3*d^3*i^2 + (i^2*log(e) + i^2)*B^2*b^3*d^3)*x^3 + (b^3*c^3*
i^2*log(e) - a*b^2*c^2*d*i^2 + 2*a^2*b*c*d^2*i^2 - a^3*d^3*i^2)*B^2 + (3*A*
B*b^3*c*d^2*i^2 + (3*b^3*c*d^2*i^2*log(e) + 2*a*b^2*d^3*i^2)*B^2)*x^2 + (2*
A*B*b^3*c^2*d*i^2 + (2*a*b^2*c*d^2*i^2 + (3*i^2*log(e) - i^2)*b^3*c^2*d)*B^
2)*x + (B^2*b^3*d^3*i^2*x^3 + (5*b^3*c*d^2*i^2 - 2*a*b^2*d^3*i^2)*B^2*x^2 +
 (3*b^3*c^2*d*i^2 + 4*a*b^2*c*d^2*i^2 - 4*a^2*b*d^3*i^2)*B^2*x + (b^3*c^3*i
^2 + 2*a^2*b*c*d^2*i^2 - 2*a^3*d^3*i^2)*B^2)*log(b*x + a))*log(d*x + c))/(b
^5*d*g^2*x^3 + a^2*b^3*c*g^2 + (b^5*c*g^2 + 2*a*b^4*d*g^2)*x^2 + (2*a*b^4*c
*g^2 + a^2*b^3*d*g^2)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABd^2i^2x^2 + 2\,ABcdi^2x + \right.}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^
2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*
d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/
(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{\left(bgx + ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^2, x)
```

3.70 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=387

$$\frac{2Bd^2i^2\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^3g^3}+\frac{2B^2d^2i^2\mathrm{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^3g^3}$$

```
[Out] (-2*B^2*d*i^2*(c + d*x))/(b^2*g^3*(a + b*x)) - (B^2*i^2*(c + d*x)^2)/(4*b*g
^3*(a + b*x)^2) - (2*B*d*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(b^2*g^3*(a + b*x)) - (B*i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(2*b*g^3*(a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])^2)/(b^2*g^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2)/(2*b*g^3*(a + b*x)^2) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (2*B*d^2*i^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x)
)])/(b^3*g^3) + (2*B^2*d^2*i^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^
3*g^3)
```

Rubi [B] time = 4.06126, antiderivative size = 932, normalized size of antiderivative = 2.41, number of steps used = 73, number of rules used = 20, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{3B^2d^2\log^2(a+bx)i^2}{2b^3g^3}-\frac{ABd^2\log^2(a+bx)i^2}{b^3g^3}-\frac{B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)i^2}{b^3g^3}-\frac{B^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)i^2}{b^3g^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
3,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*i^2)/(4*b^3*g^3*(a + b*x)^2) - (5*B^2*d*(b*c - a*d)*i^2
)/(2*b^3*g^3*(a + b*x)) - (5*B^2*d^2*i^2*Log[a + b*x])/(2*b^3*g^3) - (A*B*d
^2*i^2*Log[a + b*x]^2)/(b^3*g^3) + (3*B^2*d^2*i^2*Log[a + b*x]^2)/(2*b^3*g^
3) - (B^2*d^2*i^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c +
d*x)]^2)/(b^3*g^3) - (B^2*d^2*i^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]
^2)/(b^3*g^3) - (B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(2*b^3*g^3*(a + b*x)^2) - (3*B*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(b^3*g^3*(a + b*x)) - (3*B*d^2*i^2*Log[a + b*x]*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(b^3*g^3) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/(2*b^3*g^3*(a + b*x)^2) - (2*d*(b*c - a*d)*i^2*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^3*(a + b*x)) + (d^2*i^2*Log[a + b*x]*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^3) + (5*B^2*d^2*i^2*Log[c +
d*x])/(2*b^3*g^3) - (3*B^2*d^2*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/(b^3*g^3) + (3*B*d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
 + d*x])/(b^3*g^3) + (3*B^2*d^2*i^2*Log[c + d*x]^2)/(2*b^3*g^3) + (2*A*B*d^
2*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) - (3*B^2*d^2*i
^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) + (2*A*B*d^2*i^2*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^3) - (3*B^2*d^2*i^2*PolyLo
g[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^3) - (3*B^2*d^2*i^2*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) + (2*B^2*d^2*i^2*Log[(e*(a + b*x))/(c
+ d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^3) + (2*B^2*d^2*i
^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(70c+70dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = \int \left(\frac{4900(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^3(a+bx)^3} + \frac{9800d(bc-ad)\left(A+B\log\right.}{b^2g^3(a+bx)^2}\right.$$

$$= \frac{\left(4900d^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}dx}{b^2g^3} + \frac{(9800d(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}d}{b^2g^3}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{b^3g^3(a+bx)}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{b^3g^3(a+bx)}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{b^3g^3(a+bx)}$$

$$= -\frac{2450(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3(a+bx)^2} - \frac{9800d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{b^3g^3(a+bx)}$$

$$= -\frac{2450B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2} - \frac{14700Bd(bc-ad)\left(A+B\log\right.}{b^3g^3(a+bx)}$$

$$= -\frac{2450B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3(a+bx)^2} - \frac{14700Bd(bc-ad)\left(A+B\log\right.}{b^3g^3(a+bx)}$$

$$= -\frac{4900B^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^3g^3} - \frac{2450B(bc-ad)^2\left(A+B\log\left(\frac{e(a}{c-}\right.\right.}{b^3g^3(a+bx)^2}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log(a+bx)}{b^3g^3} - \frac{49}{}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log(a+bx)}{b^3g^3} - \frac{49}{}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log(a+bx)}{b^3g^3} - \frac{49}{}$$

$$= -\frac{1225B^2(bc-ad)^2}{b^3g^3(a+bx)^2} - \frac{12250B^2d(bc-ad)}{b^3g^3(a+bx)} - \frac{12250B^2d^2\log(a+bx)}{b^3g^3} - \frac{49}{}$$

Mathematica [B] time = 7.52191, size = 3965, normalized size = 10.25

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^3,x]
```

```
[Out] -(A^2*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*i^2)/(2*b^3*g^3*(a + b*x)^2) + (2*(-(
A^2*b*c*d*i^2) + a*A^2*d^2*i^2))/(b^3*g^3*(a + b*x)) + (A^2*d^2*i^2*Log[a +
 b*x])/(b^3*g^3) + (2*A*B*c^2*i^2*(-((a/b + x)*(2*Log[a/b + x] + 4*Log[a/b
+ x]^2))/(8*(a + b*x)^3*Log[a/b + x]) - ((b*(c/d + x))/((-a + (b*c)/d)^3*(1
 - (b*(c/d + x))/(-a + (b*c)/d))) - ((b^2*(c/d + x)^2)/((-a + (b*c)/d)^4*(1
 - (b*(c/d + x))/(-a + (b*c)/d))^2) + (2*b*(c/d + x))/((-a + (b*c)/d)^3*(1
- (b*(c/d + x))/(-a + (b*c)/d))))*Log[c/d + x] - Log[1 - (b*(c/d + x))/(-a
+ (b*c)/d)]/(-a + (b*c)/d)^2)/(2*b) - (-Log[a/b + x] + Log[c/d + x] + Log[(
a*e)/(c + d*x) + (b*e*x)/(c + d*x)])/(2*b*(a + b*x)^2)))/g^3 + (4*A*B*c*d*i
^2*(-((1 + Log[a/b + x])/(b^2*(a + b*x))) + (a*(1 + 2*Log[a/b + x]))/(4*b^2
*(a + b*x)^2) - (-(Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a + b*x]/(b*c - a*
d) - Log[c + d*x]/(b*c - a*d)))/b)/b - (a*(Log[c/d + x] + (d*(a + b*x)*(b*c
 - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]))/(b*c - a*d)^
2))/(2*b^2*(a + b*x)^2) - ((a + 2*b*x)*(-Log[a/b + x] + Log[c/d + x] + Log[
(a*e)/(c + d*x) + (b*e*x)/(c + d*x)]))/(2*b^2*(a + b*x)^2)))/g^3 + (2*A*B*d
^2*i^2*(Log[a/b + x]^2/(2*b^3) + (2*a*(1 + Log[a/b + x]))/(b^3*(a + b*x)) -
 (a^2*(1 + 2*Log[a/b + x]))/(4*b^3*(a + b*x)^2) + (2*a*(-(Log[c/d + x]/(b*(
a + b*x))) + (d*(Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b))/
b^2 + (a^2*(Log[c/d + x] + (d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*
x] - d*(a + b*x)*Log[c + d*x]))/(b*c - a*d)^2))/(2*b^3*(a + b*x)^2) + (((a*
(3*a + 4*b*x))/(a + b*x)^2 + 2*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x]
+ Log[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)]))/(2*b^3) - ((Log[c/d + x]*Log[(
a + b*x)/(a - (b*c)/d)])/b + PolyLog[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2
))/g^3 - (B^2*c^2*i^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2
*(a + b*x)^2*Log[a + b*x] + 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c + d*x)] +
4*d*(-(b*c) + a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 4*d^2*(a + b*x)
^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 2*(b*c - a*d)^2*Log[(e*(a +
b*x))/(c + d*x)]^2 + 2*d^2*(a + b*x)^2*Log[c + d*x] - 4*d*(a + b*x)*(b*c -
a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 4*d^2*(a + b*x
)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*d^2*(a
+ b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*d^2*(a + b*x)^2*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)
/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*b*(b*c - a
*d)^2*g^3*(a + b*x)^2) + (2*B^2*c*d*i^2*(-((2 + 2*Log[a/b + x] + Log[a/b +
x]^2)/(b^2*(a + b*x))) + (a*(1 + 2*Log[a/b + x] + 2*Log[a/b + x]^2))/(4*b^2
*(a + b*x)^2) + 2*(-((1 + Log[a/b + x])/(b^2*(a + b*x))) + (a*(1 + 2*Log[a/
b + x]))/(4*b^2*(a + b*x)^2) - (-(Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a +
 b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b)/b - (a*(Log[c/d + x] + (d
*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]
))/(b*c - a*d)^2))/(2*b^2*(a + b*x)^2))*(-Log[a/b + x] + Log[c/d + x] + Log
[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)]) - ((a + 2*b*x)*(-Log[a/b + x] + Log[
c/d + x] + Log[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)])^2)/(2*b^2*(a + b*x)^2)
 - 2*((d*(a + b*x)*Log[a/b + x]^2 + 2*((-(b*c) + a*d)*Log[c/d + x] + d*(a +
 b*x)*(Log[a + b*x] - Log[c + d*x])) - 2*Log[a/b + x]*((b*c - a*d)*Log[c/d
+ x] + d*(a + b*x)*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*d*(a + b*x)*PolyLog[
2, (d*(a + b*x))/(-(b*c) + a*d)])/(2*b^2*(b*c - a*d)*(a + b*x)) + (a*(-(d*(
-(b*c) + a*d)*(a + b*x)) + (b*c - a*d)^2*(1 + 2*Log[a/b + x])*Log[c/d + x]
+ d^2*(a + b*x)^2*Log[a + b*x] - d^2*(a + b*x)^2*Log[c + d*x] + d*(a + b*x)
*(d*(a + b*x)*Log[a/b + x]^2 + 2*(b*c - a*d)*(1 + Log[a/b + x]) - 2*d*(a +
b*x)*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x)
)/(-(b*c) + a*d)]))))/(4*b^2*(b*c - a*d)^2*(a + b*x)^2)) + (-(b*(c + d*x)*L
og[c/d + x]^2) + 2*d*(a + b*x)*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d
)] + 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*(b*c - a*d)*
(a + b*x)) - (a*(2*d*(-(b*c) + a*d)*(a + b*x)*Log[c/d + x] - (b*c - a*d)^2*
Log[c/d + x]^2 + d^2*(a + b*x)^2*Log[c/d + x]^2 + 2*d^2*(a + b*x)^2*Log[a +
 b*x] - 2*d^2*(a + b*x)^2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
2*d^2*(a + b*x)^2*Log[c + d*x] - 2*d^2*(a + b*x)^2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)]))/(2*b^2*(b*c - a*d)^2*(a + b*x)^2)))/g^3 + (B^2*d^2*i^2*(Log
```

```
[a/b + x]^3/(3*b^3) + (2*a*(2 + 2*Log[a/b + x] + Log[a/b + x]^2))/(b^3*(a +
 b*x)) - (a^2*(1 + 2*Log[a/b + x] + 2*Log[a/b + x]^2))/(4*b^3*(a + b*x)^2)
+ (((a*(3*a + 4*b*x))/(a + b*x)^2 + 2*Log[a + b*x])*(-Log[a/b + x] + Log[c/
d + x] + Log[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)])^2)/(2*b^3) + 2*(-Log[a/b
 + x] + Log[c/d + x] + Log[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)])*(Log[a/b +
 x]^2/(2*b^3) + (2*a*(1 + Log[a/b + x]))/(b^3*(a + b*x)) - (a^2*(1 + 2*Log[
a/b + x]))/(4*b^3*(a + b*x)^2) + (2*a*(-(Log[c/d + x]/(b*(a + b*x))) + (d*(
Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b))/b^2 + (a^2*(Log[c
/d + x] + (d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*
Log[c + d*x]))/(b*c - a*d)^2))/(2*b^3*(a + b*x)^2) - ((Log[c/d + x]*Log[(a
+ b*x)/(a - (b*c)/d)])/b + PolyLog[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2)
- (2*a*(-(b*(c + d*x)*Log[c/d + x]^2) + 2*d*(a + b*x)*Log[c/d + x]*Log[(d*(
a + b*x))/(-(b*c) + a*d)] + 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)]))/(b^3*(b*c - a*d)*(a + b*x)) + (a^2*(2*d*(-(b*c) + a*d)*(a + b*x)*Log
[c/d + x] - (b*c - a*d)^2*Log[c/d + x]^2 + d^2*(a + b*x)^2*Log[c/d + x]^2 +
 2*d^2*(a + b*x)^2*Log[a + b*x] - 2*d^2*(a + b*x)^2*Log[c/d + x]*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] - 2*d^2*(a + b*x)^2*Log[c + d*x] - 2*d^2*(a + b*x)^
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*b^3*(b*c - a*d)^2*(a + b*x)^2)
 - 2*(-((a*(d*(a + b*x)*Log[a/b + x]^2 + 2*((-(b*c) + a*d)*Log[c/d + x] + d
*(a + b*x)*(Log[a + b*x] - Log[c + d*x])) - 2*Log[a/b + x]*((b*c - a*d)*Log
[c/d + x] + d*(a + b*x)*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*d*(a + b*x)*Pol
yLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/(b^3*(b*c - a*d)*(a + b*x))) - (a^2
*(-(d*(-(b*c) + a*d)*(a + b*x)) + (b*c - a*d)^2*(1 + 2*Log[a/b + x])*Log[c/
d + x] + d^2*(a + b*x)^2*Log[a + b*x] - d^2*(a + b*x)^2*Log[c + d*x] + d*(a
 + b*x)*(d*(a + b*x)*Log[a/b + x]^2 + 2*(b*c - a*d)*(1 + Log[a/b + x]) - 2*
d*(a + b*x)*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]))))/(4*b^3*(b*c - a*d)^2*(a + b*x)^2) + (Log[a/b +
 x]^2*(Log[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*Poly
Log[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) +
 a*d)])/(2*b^3)) + (Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Lo
g[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[3, (b*(c + d*x
))/(b*c - a*d)])/b^3))/g^3
```

Maple [F] time = 3.265, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^3} \left(A + B \ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="maxima")
```

```
[Out] -A*B*c*d*i^2*(2*(2*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^3*x
^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*
```

```
x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c
- a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*
d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^
3*c*d + a^2*b^2*d^2)*g^3)) + 1/2*A^2*d^2*i^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^
2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 1/2*A*B*c^2*
i^2*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*
b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*
x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^
3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*
b^2*c*d + a^2*b*d^2)*g^3)) - (2*b*x + a)*A^2*c*d*i^2/(b^4*g^3*x^2 + 2*a*b^3
*g^3*x + a^2*b^2*g^3) - 1/2*A^2*c^2*i^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*
b*g^3) - 1/2*(4*(b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + (b^2*c^2*i^2 + 2*a*b*c*
d*i^2 - 3*a^2*d^2*i^2)*B^2 - 2*(B^2*b^2*d^2*i^2*x^2 + 2*B^2*a*b*d^2*i^2*x +
 B^2*a^2*d^2*i^2)*log(b*x + a))*log(d*x + c)^2/(b^5*g^3*x^2 + 2*a*b^4*g^3*x
 + a^2*b^3*g^3) - integrate(-(3*B^2*b^3*c^2*d*i^2*x*log(e)^2 + B^2*b^3*c^3*
i^2*log(e)^2 + (B^2*b^3*d^3*i^2*log(e)^2 + 2*A*B*b^3*d^3*i^2*log(e))*x^3 +
(3*B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A*B*b^3*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*
d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3
*i^2)*log(b*x + a)^2 + 2*(3*B^2*b^3*c^2*d*i^2*x*log(e) + B^2*b^3*c^3*i^2*lo
g(e) + (B^2*b^3*d^3*i^2*log(e) + A*B*b^3*d^3*i^2)*x^3 + (3*B^2*b^3*c*d^2*i^
2*log(e) + A*B*b^3*c*d^2*i^2)*x^2)*log(b*x + a) + ((6*a*b^2*c*d^2*i^2 - 7*a
^2*b*d^3*i^2 - (6*i^2*log(e) - i^2)*b^3*c^2*d)*B^2*x - 2*(B^2*b^3*d^3*i^2*l
og(e) + A*B*b^3*d^3*i^2)*x^3 - (2*b^3*c^3*i^2*log(e) - a*b^2*c^2*d*i^2 - 2*
a^2*b*c*d^2*i^2 + 3*a^3*d^3*i^2)*B^2 - 2*(A*B*b^3*c*d^2*i^2 + (2*a*b^2*d^3*
i^2 + (3*i^2*log(e) - 2*i^2)*b^3*c*d^2)*B^2)*x^2 - 2*(2*B^2*b^3*d^3*i^2*x^3
 + 3*(b^3*c*d^2*i^2 + a*b^2*d^3*i^2)*B^2*x^2 + 3*(b^3*c^2*d*i^2 + a^2*b*d^3
*i^2)*B^2*x + (b^3*c^3*i^2 + a^3*d^3*i^2)*B^2)*log(b*x + a))*log(d*x + c))/
(b^6*d*g^3*x^4 + a^3*b^3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5
*c*g^3 + a^2*b^4*d*g^3)*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABd^2i^2x^2 + 2\,ABcdi^2x + \cdots\right.}{b^3g^3x^3 + 3\,ab^2g^3x^2 + 3\,a^2bg^3x + a^3g^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^
2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*
d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/
(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(bgx + ag)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^3, x)
```

3.71 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=147

$$-\frac{i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)}-\frac{2Bi^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)}-\frac{2B^2i^2(c+dx)^3}{27g^4(a+bx)^3(bc-ad)}$$

```
[Out] (-2*B^2*i^2*(c + d*x)^3)/(27*(b*c - a*d)*g^4*(a + b*x)^3) - (2*B*i^2*(c + d
*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)*g^4*(a + b*x)^3)
 - (i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)*
g^4*(a + b*x)^3)
```

Rubi [C] time = 3.13179, antiderivative size = 827, normalized size of antiderivative = 5.63, number of steps used = 92, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.262, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^2\log^2(a+bx)d^3}{3b^3(bc-ad)g^4}+\frac{B^2i^2\log^2(c+dx)d^3}{3b^3(bc-ad)g^4}-\frac{2B^2i^2\log(a+bx)d^3}{9b^3(bc-ad)g^4}-\frac{2Bi^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^3}{3b^3(bc-ad)g^4}+\frac{2B^2i^2\log}{9b^3(bc}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
4,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^2)/(27*b^3*g^4*(a + b*x)^3) - (2*B^2*d*(b*c - a*d)*
i^2)/(9*b^3*g^4*(a + b*x)^2) - (2*B^2*d^2*i^2)/(9*b^3*g^4*(a + b*x)) - (2*B
^2*d^3*i^2*Log[a + b*x])/(9*b^3*(b*c - a*d)*g^4) + (B^2*d^3*i^2*Log[a + b*x
]^2)/(3*b^3*(b*c - a*d)*g^4) - (2*B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(9*b^3*g^4*(a + b*x)^3) - (2*B*d*(b*c - a*d)*i^2*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(3*b^3*g^4*(a + b*x)^2) - (2*B*d^2*i^2*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(3*b^3*g^4*(a + b*x)) - (2*B*d^3*i^2*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^3*(b*c - a*d)*g^4) - ((b*c
 - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b^3*g^4*(a + b*x)^
3) - (d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^4*(a
 + b*x)^2) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^4*(a +
 b*x)) + (2*B^2*d^3*i^2*Log[c + d*x])/(9*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*
i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b^3*(b*c - a*d)*g^4)
 + (2*B*d^3*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*b^3*(
b*c - a*d)*g^4) + (B^2*d^3*i^2*Log[c + d*x]^2)/(3*b^3*(b*c - a*d)*g^4) - (2
*B^2*d^3*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*(b*c - a*d
)*g^4) - (2*B^2*d^3*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*(b
*c - a*d)*g^4) - (2*B^2*d^3*i^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b
^3*(b*c - a*d)*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(71c+71dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx = \int\left(\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^4(a+bx)^4} + \frac{10082d(bc-ad)\left(A+B\log\left(\frac{e(\cdot}{c\cdot}\right.\right.}{b^2g^4(a+bx)^3}\right.$$

$$= \frac{\left(5041d^2\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{b^2g^4} + \frac{(10082d(bc-ad))\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}\,dx}{b^2g^4}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^3g^4(a+bx)^2}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^3g^4(a+bx)^2}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^3g^4(a+bx)^2}$$

$$= -\frac{5041(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{5041d(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^3g^4(a+bx)^2}$$

$$= -\frac{10082B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^3g^4(a+bx)^3} - \frac{10082Bd(bc-ad)\left(A+B\log\left(\frac{e}{\cdot}\right.\right.}{3b^3g^4(a+bx)^2}$$

$$= -\frac{10082B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^3g^4(a+bx)^3} - \frac{10082Bd(bc-ad)\left(A+B\log\left(\frac{e}{\cdot}\right.\right.}{3b^3g^4(a+bx)^2}$$

$$= -\frac{10082B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9b^3g^4(a+bx)^3} - \frac{10082Bd(bc-ad)\left(A+B\log\left(\frac{e}{\cdot}\right.\right.}{3b^3g^4(a+bx)^2}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)} - \frac{10082B^2d^3\,\mathrm{lo}}{9b^3(bc-}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)} - \frac{10082B^2d^3\,\mathrm{lo}}{9b^3(bc-}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)} - \frac{10082B^2d^3\,\mathrm{lo}}{9b^3(bc-}$$

$$= -\frac{10082B^2(bc-ad)^2}{27b^3g^4(a+bx)^3} - \frac{10082B^2d(bc-ad)}{9b^3g^4(a+bx)^2} - \frac{10082B^2d^2}{9b^3g^4(a+bx)} - \frac{10082B^2d^3\,\mathrm{lo}}{9b^3(bc-}$$

Mathematica [C] time = 2.20987, size = 1355, normalized size = 9.22

$$-\frac{i^2\left(18\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(bc-ad)^3+54d(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(bc-ad)^2-54d^2(ad-bc)(a+bx)^2\left(A+B\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^4,x]
```

```
[Out] -(i^2*(18*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 54*d*(b*c
- a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 54*d^2*(-(b*c)
+ a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 54*B*d^2*(a + b
*x)^2*(2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d*(a + b*x)*L
og[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(a + b*x)*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[
a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a +
 b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)]) + B*d*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 27*B*d*(
a + b*x)*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c
) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2
*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d
+ d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 +
 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a +
 b*x)^2*Log[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2
*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)]) - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B*(12*(b*c
- a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x
)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*L
og[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 +
2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a +
b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) +
 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a
+ b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] -
 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(54*b^3*
(b*c - a*d)*g^4*(a + b*x)^3)
```

Maple [B] time = 0.055, size = 890, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x)
```

```
[Out] 1/3*e^3*d*i^2/(a*d-b*c)^2/g^4*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1
/3*e^3*i^2/(a*d-b*c)^2/g^4*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c+2/
3*e^3*d*i^2/(a*d-b*c)^2/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*a-2/3*e^3*i^2/(a*d-b*c)^2/g^4*A*B/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+2/9*e^3*d*i^2/(
a*d-b*c)^2/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-2/9*e^3*i^2/(a*d
-b*c)^2/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c+1/3*e^3*d*i^2/(a*
d-b*c)^2/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2*a-1/3*e^3*i^2/(a*d-b*c)^2/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x
```

```
+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+2/9*e^3*d*i^2/(a*d-b*c)^2/
g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*a-2/9*e^3*i^2/(a*d-b*c)^2/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+2/27*e^3*d*i^2/(a*d-b*c)^2/g^4*B^2/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-2/27*e^3*i^2/(a*d-b*c)^2/g^4*B^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c
```

Maxima [B] time = 3.36555, size = 7468, normalized size = 50.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, alg
orithm="maxima")
```

```
[Out] -1/3*(3*b*x + a)*B^2*c*d*i^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^
4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 +
 3*a*b*x + a^2)*B^2*d^2*i^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^4
*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/54*(6*((6*b^2*d
^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((
b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d
 + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4
*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((
b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x
 + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*
d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b
^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*
a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d -
54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^
2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 +
33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^
3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2
*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d
*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^
2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c
^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B
^2*c^2*i^2 - 1/54*(6*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*
d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^
2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3
*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (
a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log
(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) +
 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c
*d^2 - a^3*b^2*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (19*a*b^3*
c^3 - 189*a^2*b^2*c^2*d + 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d -
32*a*b^3*c*d^2 + 5*a^2*b^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*
c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2
*c*d^2 - a^3*b*d^3)*x)*log(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^
4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b
^2*c*d^2 - a^3*b*d^3)*x)*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d +
135*a^2*b^2*c*d^2 - 19*a^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b
^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(2
7*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*
d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)
*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 +
```

```
(3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*
a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^5*c^3*g^4
- 3*a^4*b^4*c^2*d*g^4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^
4 - 3*a*b^7*c^2*d*g^4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b
^7*c^3*g^4 - 3*a^2*b^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x
^2 + 3*(a^2*b^6*c^3*g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b
^3*d^3*g^4)*x))*B^2*c*d*i^2 - 1/54*(6*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^
4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*
a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^
3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 -
2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3
*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3
 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3
*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*
d^2 - a^3*b^3*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (85*a^2*b^3
*c^3 - 108*a^3*b^2*c^2*d + 27*a^4*b*c*d^2 - 4*a^5*d^3 + 6*(18*b^5*c^3 - 27*
a*b^4*c^2*d + 11*a^2*b^3*c*d^2 - 2*a^3*b^2*d^3)*x^2 - 18*(3*a^3*b^2*c^2*d -
 3*a^4*b*c*d^2 + a^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3
+ 3*(3*a*b^4*c^2*d - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*c^2*
d - 3*a^3*b^2*c*d^2 + a^4*b*d^3)*x)*log(b*x + a)^2 - 18*(3*a^3*b^2*c^2*d -
3*a^4*b*c*d^2 + a^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 +
 3*(3*a*b^4*c^2*d - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*c^2*d
 - 3*a^3*b^2*c*d^2 + a^4*b*d^3)*x)*log(d*x + c)^2 + 3*(63*a*b^4*c^3 - 86*a^
2*b^3*c^2*d + 27*a^3*b^2*c*d^2 - 4*a^4*b*d^3)*x + 6*(18*a^3*b^2*c^2*d - 9*a
^4*b*c*d^2 + 2*a^5*d^3 + (18*b^5*c^2*d - 9*a*b^4*c*d^2 + 2*a^2*b^3*d^3)*x^3
 + 3*(18*a*b^4*c^2*d - 9*a^2*b^3*c*d^2 + 2*a^3*b^2*d^3)*x^2 + 3*(18*a^2*b^3
*c^2*d - 9*a^3*b^2*c*d^2 + 2*a^4*b*d^3)*x)*log(b*x + a) - 6*(18*a^3*b^2*c^2
*d - 9*a^4*b*c*d^2 + 2*a^5*d^3 + (18*b^5*c^2*d - 9*a*b^4*c*d^2 + 2*a^2*b^3*
d^3)*x^3 + 3*(18*a*b^4*c^2*d - 9*a^2*b^3*c*d^2 + 2*a^3*b^2*d^3)*x^2 + 3*(18
*a^2*b^3*c^2*d - 9*a^3*b^2*c*d^2 + 2*a^4*b*d^3)*x - 6*(3*a^3*b^2*c^2*d - 3*
a^4*b*c*d^2 + a^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 3
*(3*a*b^4*c^2*d - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*c^2*d -
 3*a^3*b^2*c*d^2 + a^4*b*d^3)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^6*c^3*g
^4 - 3*a^4*b^5*c^2*d*g^4 + 3*a^5*b^4*c*d^2*g^4 - a^6*b^3*d^3*g^4 + (b^9*c^3
*g^4 - 3*a*b^8*c^2*d*g^4 + 3*a^2*b^7*c*d^2*g^4 - a^3*b^6*d^3*g^4)*x^3 + 3*(
a*b^8*c^3*g^4 - 3*a^2*b^7*c^2*d*g^4 + 3*a^3*b^6*c*d^2*g^4 - a^4*b^5*d^3*g^4
)*x^2 + 3*(a^2*b^7*c^3*g^4 - 3*a^3*b^6*c^2*d*g^4 + 3*a^4*b^5*c*d^2*g^4 - a^
5*b^4*d^3*g^4)*x))*B^2*d^2*i^2 - 1/9*A*B*d^2*i^2*(6*(3*b^2*x^2 + 3*a*b*x +
a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 +
3*a^2*b^4*g^4*x + a^3*b^3*g^4) + (11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2
+ 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^
2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*
(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*
b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*
g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a
*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c
*d^2 + a^2*d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 -
a^3*b^3*d^3)*g^4)) - 1/9*A*B*c*d*i^2*(6*(3*b*x + a)*log(b*e*x/(d*x + c) + a
*e/(d*x + c))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^
4) + (5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^
2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d +
 a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2
 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a
^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c
^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a
*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^
3)*g^4)) - 1/9*A*B*c^2*i^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2
*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^
4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^
```

```
2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5
*b*d^2)*g^4) + 6*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^
3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3
*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4
*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*c^2*i^2
*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*
a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*(3*b*x + a)*A^2*c*d*i^2/(b^5*g^4*x^3 + 3*a
*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x +
a^2)*A^2*d^2*i^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3
*g^4) - 1/3*A^2*c^2*i^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x +
a^3*b*g^4)
```

Fricas [B] time = 0.562854, size = 892, normalized size = 6.07

$$-\frac{3\left(\left(9A^2+6AB+2B^2\right)b^3cd^2-\left(9A^2+6AB+2B^2\right)ab^2d^3\right)i^2x^2+3\left(\left(9A^2+6AB+2B^2\right)b^3c^2d-\left(9A^2+6AB+2B^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, alg
orithm="fricas")
```

```
[Out] -1/27*(3*((9*A^2 + 6*A*B + 2*B^2)*b^3*c*d^2 - (9*A^2 + 6*A*B + 2*B^2)*a*b^2
*d^3)*i^2*x^2 + 3*((9*A^2 + 6*A*B + 2*B^2)*b^3*c^2*d - (9*A^2 + 6*A*B + 2*B
^2)*a^2*b*d^3)*i^2*x + ((9*A^2 + 6*A*B + 2*B^2)*b^3*c^3 - (9*A^2 + 6*A*B +
2*B^2)*a^3*d^3)*i^2 + 9*(B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*
B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 6*(
(3*A*B + B^2)*b^3*d^3*i^2*x^3 + 3*(3*A*B + B^2)*b^3*c*d^2*i^2*x^2 + 3*(3*A*
B + B^2)*b^3*c^2*d*i^2*x + (3*A*B + B^2)*b^3*c^3*i^2)*log((b*e*x + a*e)/(d*
x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*x^2 + 3*(
a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)
```

Sympy [B] time = 69.1096, size = 1178, normalized size = 8.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -2*B*d**3*i**2*(3*A + B)*log(x + (6*A*B*a*d**4*i**2 + 6*A*B*b*c*d**3*i**2 +
 2*B**2*a*d**4*i**2 + 2*B**2*b*c*d**3*i**2 - 2*B*a**2*d**5*i**2*(3*A + B)/(
a*d - b*c) + 4*B*a*b*c*d**4*i**2*(3*A + B)/(a*d - b*c) - 2*B*b**2*c**2*d**3
*i**2*(3*A + B)/(a*d - b*c))/(12*A*B*b*d**4*i**2 + 4*B**2*b*d**4*i**2))/(9*
b**3*g**4*(a*d - b*c)) + 2*B*d**3*i**2*(3*A + B)*log(x + (6*A*B*a*d**4*i**2
 + 6*A*B*b*c*d**3*i**2 + 2*B**2*a*d**4*i**2 + 2*B**2*b*c*d**3*i**2 + 2*B*a*
*2*d**5*i**2*(3*A + B)/(a*d - b*c) - 4*B*a*b*c*d**4*i**2*(3*A + B)/(a*d - b
*c) + 2*B*b**2*c**2*d**3*i**2*(3*A + B)/(a*d - b*c))/(12*A*B*b*d**4*i**2 +
4*B**2*b*d**4*i**2))/(9*b**3*g**4*(a*d - b*c)) + (B**2*c**3*i**2 + 3*B**2*c
**2*d*i**2*x + 3*B**2*c*d**2*i**2*x**2 + B**2*d**3*i**2*x**3)*log(e*(a + b*
x)/(c + d*x))**2/(3*a**4*d*g**4 - 3*a**3*b*c*g**4 + 9*a**3*b*d*g**4*x - 9*a
**2*b**2*c*g**4*x + 9*a**2*b**2*d*g**4*x**2 - 9*a*b**3*c*g**4*x**2 + 3*a*b*
*3*d*g**4*x**3 - 3*b**4*c*g**4*x**3) - (9*A**2*a**2*d**2*i**2 + 9*A**2*a*b*
```

```
c*d*i**2 + 9*A**2*b**2*c**2*i**2 + 6*A*B*a**2*d**2*i**2 + 6*A*B*a*b*c*d*i**
2 + 6*A*B*b**2*c**2*i**2 + 2*B**2*a**2*d**2*i**2 + 2*B**2*a*b*c*d*i**2 + 2*
B**2*b**2*c**2*i**2 + x**2*(27*A**2*b**2*d**2*i**2 + 18*A*B*b**2*d**2*i**2
+ 6*B**2*b**2*d**2*i**2) + x*(27*A**2*a*b*d**2*i**2 + 27*A**2*b**2*c*d*i**2
 + 18*A*B*a*b*d**2*i**2 + 18*A*B*b**2*c*d*i**2 + 6*B**2*a*b*d**2*i**2 + 6*B
**2*b**2*c*d*i**2))/(27*a**3*b**3*g**4 + 81*a**2*b**4*g**4*x + 81*a*b**5*g*
*4*x**2 + 27*b**6*g**4*x**3) + (-6*A*B*a**2*d**2*i**2 - 6*A*B*a*b*c*d*i**2
- 18*A*B*a*b*d**2*i**2*x - 6*A*B*b**2*c**2*i**2 - 18*A*B*b**2*c*d*i**2*x -
18*A*B*b**2*d**2*i**2*x**2 - 2*B**2*a**2*d**2*i**2 - 2*B**2*a*b*c*d*i**2 -
6*B**2*a*b*d**2*i**2*x - 2*B**2*b**2*c**2*i**2 - 6*B**2*b**2*c*d*i**2*x - 6
*B**2*b**2*d**2*i**2*x**2)*log(e*(a + b*x)/(c + d*x))/(9*a**3*b**3*g**4 + 2
7*a**2*b**4*g**4*x + 27*a*b**5*g**4*x**2 + 9*b**6*g**4*x**3)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^4, x)
```

3.72 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=299

$$-\frac{bi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^2}-\frac{bBi^2(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^5(a+bx)^3(bc-ad)^2}+\frac{2Bdi^2(\cdots}{\cdots}$$

```
[Out] (2*B^2*d*i^2*(c + d*x)^3)/(27*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B^2*i^2*(
c + d*x)^4)/(32*(b*c - a*d)^2*g^5*(a + b*x)^4) + (2*B*d*i^2*(c + d*x)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B
*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)^2*g^5
*(a + b*x)^4) + (d*i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(3*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(4*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Rubi [C] time = 3.69071, antiderivative size = 920, normalized size of antiderivative = 3.08, number of steps used = 104, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.262, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2i^2\log^2(a+bx)d^4}{12b^3(bc-ad)^2g^5}-\frac{B^2i^2\log^2(c+dx)d^4}{12b^3(bc-ad)^2g^5}+\frac{7B^2i^2\log(a+bx)d^4}{72b^3(bc-ad)^2g^5}+\frac{Bi^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^4}{6b^3(bc-ad)^2g^5}-\frac{7B^2i^2\log\cdots}{72b^3(bc\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
5,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*i^2)/(32*b^3*g^5*(a + b*x)^4) - (11*B^2*d*(b*c - a*d)*i
^2)/(216*b^3*g^5*(a + b*x)^3) + (5*B^2*d^2*i^2)/(144*b^3*g^5*(a + b*x)^2) +
 (7*B^2*d^3*i^2)/(72*b^3*(b*c - a*d)*g^5*(a + b*x)) + (7*B^2*d^4*i^2*Log[a
+ b*x])/(72*b^3*(b*c - a*d)^2*g^5) - (B^2*d^4*i^2*Log[a + b*x]^2)/(12*b^3*(
b*c - a*d)^2*g^5) - (B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(8*b^3*g^5*(a + b*x)^4) - (5*B*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(18*b^3*g^5*(a + b*x)^3) - (B*d^2*i^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(12*b^3*g^5*(a + b*x)^2) + (B*d^3*i^2*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(6*b^3*(b*c - a*d)*g^5*(a + b*x)) + (B*d^4*i^2*Log[a + b*
x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b^3*(b*c - a*d)^2*g^5) - ((b*c
- a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b^3*g^5*(a + b*x)^4
) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b^3*g^5
*(a + b*x)^3) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^3*g^5
*(a + b*x)^2) - (7*B^2*d^4*i^2*Log[c + d*x])/(72*b^3*(b*c - a*d)^2*g^5) + (
B^2*d^4*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(6*b^3*(b*c - a
*d)^2*g^5) - (B*d^4*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/
(6*b^3*(b*c - a*d)^2*g^5) - (B^2*d^4*i^2*Log[c + d*x]^2)/(12*b^3*(b*c - a*d
)^2*g^5) + (B^2*d^4*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(6*b^3
*(b*c - a*d)^2*g^5) + (B^2*d^4*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]
)/(6*b^3*(b*c - a*d)^2*g^5) + (B^2*d^4*i^2*PolyLog[2, (b*(c + d*x))/(b*c -
a*d)])/(6*b^3*(b*c - a*d)^2*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
```

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(72c+72dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx = \int \left(\frac{5184(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^5(a+bx)^5} + \frac{10368d(bc-ad)\left(A+B\log\left(\frac{e(}{}\right.\right.}{b^2g^5(a+bx)^4}\right.$$

$$= \frac{\left(5184d^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}\,dx}{b^2g^5} + \frac{(10368d(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}\,dx}{b^2g^5}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3g^5(a+bx)^3}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3g^5(a+bx)^3}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3g^5(a+bx)^3}$$

$$= -\frac{1296(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{3456d(bc-ad)\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{b^3g^5(a+bx)^3}$$

$$= -\frac{648B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{1440Bd(bc-ad)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^3g^5(a+bx)^3}$$

$$= -\frac{648B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{1440Bd(bc-ad)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^3g^5(a+bx)^3}$$

$$= -\frac{648B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^5(a+bx)^4} - \frac{1440Bd(bc-ad)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^3g^5(a+bx)^3}$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} + \frac{504B^2d^3}{b^3(bc-ad)g^5(a+}$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} + \frac{504B^2d^3}{b^3(bc-ad)g^5(a+}$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} + \frac{504B^2d^3}{b^3(bc-ad)g^5(a+}$$

$$= -\frac{162B^2(bc-ad)^2}{b^3g^5(a+bx)^4} - \frac{264B^2d(bc-ad)}{b^3g^5(a+bx)^3} + \frac{180B^2d^2}{b^3g^5(a+bx)^2} + \frac{504B^2d^3}{b^3(bc-ad)g^5(a+}$$

Mathematica [C] time = 3.10902, size = 1788, normalized size = 5.98

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^5,x]
```

```
[Out] -(i^2*(216*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 576*d*(-(
b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 432*d^2*(b
*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 216*B*d^2*
(a + b*x)^2*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(
b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x
)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a
*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^
2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(
a + b*x)^2*Log[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 32*B*d*(
a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c
 - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*
d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Lo
g[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a
*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)
*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a +
b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c -
a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a
+ b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*
x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c
) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c -
a*d)])) + 3*B*(36*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 48*d
*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^2*(
b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^3*(-(
b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 144*d^4*(a +
 b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^4*(a + b*
x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 144*B*d^3*(a + b*x
)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*
B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a
+ b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)*(
2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)
^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B
*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a
 + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a +
b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a + b*x
]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)]))))/(864*b^3*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Maple [B] time = 0.053, size = 1814, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x)
```

```
[Out] 1/3*e^3*d^2*i^2/(a*d-b*c)^3/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a
-1/3*e^3*d*i^2/(a*d-b*c)^3/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*
c-1/4*e^4*d*i^2/(a*d-b*c)^3/g^5*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4
*a+1/4*e^4*i^2/(a*d-b*c)^3/g^5*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^
4*c+2/3*e^3*d^2*i^2/(a*d-b*c)^3/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2/3*e^3*d*i^2/(a*d-b*c)^3/g^5*A*B/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+2/9*e
^3*d^2*i^2/(a*d-b*c)^3/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-2/9*
e^3*d*i^2/(a*d-b*c)^3/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-1/2
*e^4*d*i^2/(a*d-b*c)^3/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/2*e^4*i^2/(a*d-b*c)^3/g^5*A*B*b^2/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/8*e^4*d*i^
2/(a*d-b*c)^3/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/8*e^4*i^2
/(a*d-b*c)^3/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+1/3*e^3*d^
2*i^2/(a*d-b*c)^3/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2*a-1/3*e^3*d*i^2/(a*d-b*c)^3/g^5*B^2/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+2/9*e^3*d^2*i^2
/(a*d-b*c)^3/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*a-2/9*e^3*d*i^2/(a*d-b*c)^3/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/
(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+2/27*e^3*d^2*i^2/(a*d-b*
c)^3/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-2/27*e^3*d*i^2/(a*d-b*
c)^3/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-1/4*e^4*d*i^2/(a*d-b
*c)^3/g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2*a+1/4*e^4*i^2/(a*d-b*c)^3/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/8*e^4*d*i^2/(a*d-b*c)^3
/g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*a+1/8*e^4*i^2/(a*d-b*c)^3/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*
b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/32*e^4*d*i^2/(a*d-b*c)^3/g^5*B^2
*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/32*e^4*i^2/(a*d-b*c)^3/g^5*B^2
*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c
```

Maxima [B] time = 4.87487, size = 10842, normalized size = 36.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="maxima")
```

```
[Out] -1/6*(4*b*x + a)*B^2*c*d*i^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^
5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5
) - 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*B^2*d^2*i^2*log(b*e*x/(d*x + c) + a*e/
(d*x + c))^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4
*g^5*x + a^4*b^3*g^5) + 1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c
^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b
^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a
^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^
3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a
^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*
a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6
*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*
d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x
```

+ c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*
b*d^4)*g^5))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c
^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3
 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*
x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
 + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*
d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b
^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*
b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 1
2*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4
*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4
*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^
5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g
^5 + (b^9*c^4*g^5 - 4*a*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c
*d^3*g^5 + a^4*b^5*d^4*g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 +
6*a^3*b^6*c^2*d^2*g^5 - 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2
*b^7*c^4*g^5 - 4*a^3*b^6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^
3*g^5 + a^6*b^3*d^4*g^5)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6
*a^5*b^4*c^2*d^2*g^5 - 4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c^2*i
^2 - 1/432*(12*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d
^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7
*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a
^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5
x^4 + 4(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*
x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5
x^2 + 4(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^
5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)
+ 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4
*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log
(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 +
 a^4*b^2*d^4)*g^5))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (37*a*b^4*c^4 -
304*a^2*b^3*c^3*d + 1512*a^3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 +
 12*(88*b^5*c^2*d^2 - 101*a*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5*c^3
*d - 609*a*b^4*c^2*d^2 + 648*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*(4*a^
4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^
2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3
 - a^4*b*d^4)*x)*log(b*x + a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^
3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d
^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(d*x + c)^2 +
 4*(16*b^5*c^4 - 163*a*b^4*c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*c*d^
3 + 115*a^4*b*d^4)*x + 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13
*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c
*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x)*log(b*x
 + a) - 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4
 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b
^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 - a
^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^
3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)
*x)*log(b*x + a))*log(d*x + c))/(a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*g^5 + 6*
a^6*b^4*c^2*d^2*g^5 - 4*a^7*b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10*c^4*g^5
 - 4*a*b^9*c^3*d*g^5 + 6*a^2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 + a^4*b^
6*d^4*g^5)*x^4 + 4*(a*b^9*c^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*d^2
*g^5 - 4*a^4*b^6*c*d^3*g^5 + a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 - 4*
a^3*b^7*c^3*d*g^5 + 6*a^4*b^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6*b^4*d
^4*g^5)*x^2 + 4*(a^3*b^7*c^4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2*d^2*
g^5 - 4*a^6*b^4*c*d^3*g^5 + a^7*b^3*d^4*g^5)*x))*B^2*c*d*i^2 - 1/864*(12*((
13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*
c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d +
29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d

+ 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8
*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*
c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6
*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^
5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c
*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b
*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a
^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/
((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d
^4)*g^5))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (115*a^2*b^4*c^4 - 1360*a^
3*b^3*c^3*d + 1512*a^4*b^2*c^2*d^2 - 304*a^5*b*c*d^3 + 37*a^6*d^4 - 12*(108
*b^6*c^3*d - 148*a*b^5*c^2*d^2 + 47*a^2*b^4*c*d^3 - 7*a^3*b^3*d^4)*x^3 + 6*
(36*b^6*c^4 - 712*a*b^5*c^3*d + 903*a^2*b^4*c^2*d^2 - 264*a^3*b^3*c*d^3 + 3
7*a^4*b^2*d^4)*x^2 + 72*(6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (6*b
^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*
b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4
*b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x)*log(
b*x + a)^2 + 72*(6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^6*c^2*d
^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b^4*c*d^
3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4
)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x)*log(d*x + c)
^2 + 4*(76*a*b^5*c^4 - 1057*a^2*b^4*c^3*d + 1248*a^3*b^3*c^2*d^2 - 304*a^4*
b^2*c*d^3 + 37*a^5*b*d^4)*x - 12*(108*a^4*b^2*c^2*d^2 - 40*a^5*b*c*d^3 + 7*
a^6*d^4 + (108*b^6*c^2*d^2 - 40*a*b^5*c*d^3 + 7*a^2*b^4*d^4)*x^4 + 4*(108*a
*b^5*c^2*d^2 - 40*a^2*b^4*c*d^3 + 7*a^3*b^3*d^4)*x^3 + 6*(108*a^2*b^4*c^2*d
^2 - 40*a^3*b^3*c*d^3 + 7*a^4*b^2*d^4)*x^2 + 4*(108*a^3*b^3*c^2*d^2 - 40*a^
4*b^2*c*d^3 + 7*a^5*b*d^4)*x)*log(b*x + a) + 12*(108*a^4*b^2*c^2*d^2 - 40*a
^5*b*c*d^3 + 7*a^6*d^4 + (108*b^6*c^2*d^2 - 40*a*b^5*c*d^3 + 7*a^2*b^4*d^4)
x^4 + 4(108*a*b^5*c^2*d^2 - 40*a^2*b^4*c*d^3 + 7*a^3*b^3*d^4)*x^3 + 6*(10
8*a^2*b^4*c^2*d^2 - 40*a^3*b^3*c*d^3 + 7*a^4*b^2*d^4)*x^2 + 4*(108*a^3*b^3*
c^2*d^2 - 40*a^4*b^2*c*d^3 + 7*a^5*b*d^4)*x - 12*(6*a^4*b^2*c^2*d^2 - 4*a^5
*b*c*d^3 + a^6*d^4 + (6*b^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 + 4*
(6*a*b^5*c^2*d^2 - 4*a^2*b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^
2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c
*d^3 + a^5*b*d^4)*x)*log(b*x + a))*log(d*x + c))/(a^4*b^7*c^4*g^5 - 4*a^5*b
^6*c^3*d*g^5 + 6*a^6*b^5*c^2*d^2*g^5 - 4*a^7*b^4*c*d^3*g^5 + a^8*b^3*d^4*g^
5 + (b^11*c^4*g^5 - 4*a*b^10*c^3*d*g^5 + 6*a^2*b^9*c^2*d^2*g^5 - 4*a^3*b^8*
c*d^3*g^5 + a^4*b^7*d^4*g^5)*x^4 + 4*(a*b^10*c^4*g^5 - 4*a^2*b^9*c^3*d*g^5
+ 6*a^3*b^8*c^2*d^2*g^5 - 4*a^4*b^7*c*d^3*g^5 + a^5*b^6*d^4*g^5)*x^3 + 6*(a
^2*b^9*c^4*g^5 - 4*a^3*b^8*c^3*d*g^5 + 6*a^4*b^7*c^2*d^2*g^5 - 4*a^5*b^6*c*
d^3*g^5 + a^6*b^5*d^4*g^5)*x^2 + 4*(a^3*b^8*c^4*g^5 - 4*a^4*b^7*c^3*d*g^5 +
6*a^5*b^6*c^2*d^2*g^5 - 4*a^6*b^5*c*d^3*g^5 + a^7*b^4*d^4*g^5)*x))*B^2*d^2
*i^2 - 1/72*A*B*d^2*i^2*(12*(6*b^2*x^2 + 4*a*b*x + a^2)*log(b*e*x/(d*x + c)
+ a*e/(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^
3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*
c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*
(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10
*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c
^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3
- 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3
- 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^
3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 -
3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2
- 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5
*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*
c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2
- 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/36*A*B*c*d*i^2*(12*(4*b*x + a)*
log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2
*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*b^3*c^3 - 33*a^2*b^2*c

```
^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(
4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3
*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*
a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a
^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*
a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3
*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^
6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6
*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g
^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2
*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) + 1/24*A*B*c^2*i^2*((12
*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6
*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^
3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 +
4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6
*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 +
4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (
a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 12*log(
b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3
*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4
*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d
^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c
*d^3 + a^4*b*d^4)*g^5)) - 1/4*B^2*c^2*i^2*log(b*e*x/(d*x + c) + a*e/(d*x +
c))^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x
+ a^4*b*g^5) - 1/6*(4*b*x + a)*A^2*c*d*i^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 +
 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/12*(6*b^2*x^2 + 4*a
*b*x + a^2)*A^2*d^2*i^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2
+ 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/4*A^2*c^2*i^2/(b^5*g^5*x^4 + 4*a*b^4*g
^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 0.590224, size = 1733, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="fricas")
```

```
[Out] 1/864*(12*((12*A*B + 7*B^2)*b^4*c*d^3 - (12*A*B + 7*B^2)*a*b^3*d^4)*i^2*x^3
 - 6*((72*A^2 + 12*A*B - 5*B^2)*b^4*c^2*d^2 - 16*(9*A^2 + 6*A*B + 2*B^2)*a*
b^3*c*d^3 + (72*A^2 + 84*A*B + 37*B^2)*a^2*b^2*d^4)*i^2*x^2 - 4*((144*A^2 +
 60*A*B + 11*B^2)*b^4*c^3*d - 24*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*c^2*d^2 + (7
2*A^2 + 84*A*B + 37*B^2)*a^3*b*d^4)*i^2*x - (27*(8*A^2 + 4*A*B + B^2)*b^4*c
^4 - 32*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*c^3*d + (72*A^2 + 84*A*B + 37*B^2)*a^
4*d^4)*i^2 + 72*(B^2*b^4*d^4*i^2*x^4 + 4*B^2*a*b^3*d^4*i^2*x^3 - 6*(B^2*b^4
*c^2*d^2 - 2*B^2*a*b^3*c*d^3)*i^2*x^2 - 4*(2*B^2*b^4*c^3*d - 3*B^2*a*b^3*c^
2*d^2)*i^2*x - (3*B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d)*i^2)*log((b*e*x + a*e)/(
d*x + c))^2 + 12*((12*A*B + 7*B^2)*b^4*d^4*i^2*x^4 + 4*(3*B^2*b^4*c*d^3 + 4
*(3*A*B + B^2)*a*b^3*d^4)*i^2*x^3 - 6*((12*A*B + B^2)*b^4*c^2*d^2 - 8*(3*A*
B + B^2)*a*b^3*c*d^3)*i^2*x^2 - 4*((24*A*B + 5*B^2)*b^4*c^3*d - 12*(3*A*B +
 B^2)*a*b^3*c^2*d^2)*i^2*x - (9*(4*A*B + B^2)*b^4*c^4 - 16*(3*A*B + B^2)*a*
b^3*c^3*d)*i^2)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^2 - 2*a*b^8*c*d + a^2
*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)*g^5*x^3 + 6
*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b^6*c^2 - 2*a
^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d + a^6*b^3*d^
2)*g^5)
```

Sympy [B] time = 133.626, size = 2054, normalized size = 6.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] -B*d**4*i**2*(12*A + 7*B)*log(x + (12*A*B*a*d**5*i**2 + 12*A*B*b*c*d**4*i**
2 + 7*B**2*a*d**5*i**2 + 7*B**2*b*c*d**4*i**2 - B*a**3*d**7*i**2*(12*A + 7*
B)/(a*d - b*c)**2 + 3*B*a**2*b*c*d**6*i**2*(12*A + 7*B)/(a*d - b*c)**2 - 3*
B*a*b**2*c**2*d**5*i**2*(12*A + 7*B)/(a*d - b*c)**2 + B*b**3*c**3*d**4*i**2
*(12*A + 7*B)/(a*d - b*c)**2)/(24*A*B*b*d**5*i**2 + 14*B**2*b*d**5*i**2))/(
72*b**3*g**5*(a*d - b*c)**2) + B*d**4*i**2*(12*A + 7*B)*log(x + (12*A*B*a*d
**5*i**2 + 12*A*B*b*c*d**4*i**2 + 7*B**2*a*d**5*i**2 + 7*B**2*b*c*d**4*i**2
 + B*a**3*d**7*i**2*(12*A + 7*B)/(a*d - b*c)**2 - 3*B*a**2*b*c*d**6*i**2*(1
2*A + 7*B)/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d**5*i**2*(12*A + 7*B)/(a*d - b
*c)**2 - B*b**3*c**3*d**4*i**2*(12*A + 7*B)/(a*d - b*c)**2)/(24*A*B*b*d**5*
i**2 + 14*B**2*b*d**5*i**2))/(72*b**3*g**5*(a*d - b*c)**2) + (4*B**2*a*c**3
*d*i**2 + 12*B**2*a*c**2*d**2*i**2*x + 12*B**2*a*c*d**3*i**2*x**2 + 4*B**2*
a*d**4*i**2*x**3 - 3*B**2*b*c**4*i**2 - 8*B**2*b*c**3*d*i**2*x - 6*B**2*b*c
**2*d**2*i**2*x**2 + B**2*b*d**4*i**2*x**4)*log(e*(a + b*x)/(c + d*x))**2/(
12*a**6*d**2*g**5 - 24*a**5*b*c*d*g**5 + 48*a**5*b*d**2*g**5*x + 12*a**4*b*
*2*c**2*g**5 - 96*a**4*b**2*c*d*g**5*x + 72*a**4*b**2*d**2*g**5*x**2 + 48*a
**3*b**3*c**2*g**5*x - 144*a**3*b**3*c*d*g**5*x**2 + 48*a**3*b**3*d**2*g**5
*x**3 + 72*a**2*b**4*c**2*g**5*x**2 - 96*a**2*b**4*c*d*g**5*x**3 + 12*a**2*
b**4*d**2*g**5*x**4 + 48*a*b**5*c**2*g**5*x**3 - 24*a*b**5*c*d*g**5*x**4 +
12*b**6*c**2*g**5*x**4) + (-12*A*B*a**3*d**3*i**2 - 12*A*B*a**2*b*c*d**2*i*
*2 - 48*A*B*a**2*b*d**3*i**2*x - 12*A*B*a*b**2*c**2*d*i**2 - 48*A*B*a*b**2*
c*d**2*i**2*x - 72*A*B*a*b**2*d**3*i**2*x**2 + 36*A*B*b**3*c**3*i**2 + 96*A
*B*b**3*c**2*d*i**2*x + 72*A*B*b**3*c*d**2*i**2*x**2 - 7*B**2*a**3*d**3*i**
2 - 7*B**2*a**2*b*c*d**2*i**2 - 28*B**2*a**2*b*d**3*i**2*x - 7*B**2*a*b**2*
c**2*d*i**2 - 28*B**2*a*b**2*c*d**2*i**2*x - 42*B**2*a*b**2*d**3*i**2*x**2
+ 9*B**2*b**3*c**3*i**2 + 20*B**2*b**3*c**2*d*i**2*x + 6*B**2*b**3*c*d**2*i
**2*x**2 - 12*B**2*b**3*d**3*i**2*x**3)*log(e*(a + b*x)/(c + d*x))/(72*a**5
*b**3*d*g**5 - 72*a**4*b**4*c*g**5 + 288*a**4*b**4*d*g**5*x - 288*a**3*b**5
*c*g**5*x + 432*a**3*b**5*d*g**5*x**2 - 432*a**2*b**6*c*g**5*x**2 + 288*a**
2*b**6*d*g**5*x**3 - 288*a*b**7*c*g**5*x**3 + 72*a*b**7*d*g**5*x**4 - 72*b*
*8*c*g**5*x**4) - (72*A**2*a**3*d**3*i**2 + 72*A**2*a**2*b*c*d**2*i**2 + 72
*A**2*a*b**2*c**2*d*i**2 - 216*A**2*b**3*c**3*i**2 + 84*A*B*a**3*d**3*i**2
+ 84*A*B*a**2*b*c*d**2*i**2 + 84*A*B*a*b**2*c**2*d*i**2 - 108*A*B*b**3*c**3
*i**2 + 37*B**2*a**3*d**3*i**2 + 37*B**2*a**2*b*c*d**2*i**2 + 37*B**2*a*b**
2*c**2*d*i**2 - 27*B**2*b**3*c**3*i**2 + x**3*(144*A*B*b**3*d**3*i**2 + 84*
B**2*b**3*d**3*i**2) + x**2*(432*A**2*a*b**2*d**3*i**2 - 432*A**2*b**3*c*d*
*2*i**2 + 504*A*B*a*b**2*d**3*i**2 - 72*A*B*b**3*c*d**2*i**2 + 222*B**2*a*b
**2*d**3*i**2 + 30*B**2*b**3*c*d**2*i**2) + x*(288*A**2*a**2*b*d**3*i**2 +
288*A**2*a*b**2*c*d**2*i**2 - 576*A**2*b**3*c**2*d*i**2 + 336*A*B*a**2*b*d*
*3*i**2 + 336*A*B*a*b**2*c*d**2*i**2 - 240*A*B*b**3*c**2*d*i**2 + 148*B**2*
a**2*b*d**3*i**2 + 148*B**2*a*b**2*c*d**2*i**2 - 44*B**2*b**3*c**2*d*i**2))
/(864*a**5*b**3*d*g**5 - 864*a**4*b**4*c*g**5 + x**4*(864*a*b**7*d*g**5 - 8
64*b**8*c*g**5) + x**3*(3456*a**2*b**6*d*g**5 - 3456*a*b**7*c*g**5) + x**2*
(5184*a**3*b**5*d*g**5 - 5184*a**2*b**6*c*g**5) + x*(3456*a**4*b**4*d*g**5
- 3456*a**3*b**5*c*g**5))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(bgx + ag)^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^5, x)
```

3.73 $\int \frac{(ci+dix)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=463

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{5g^6(a+bx)^5(bc-ad)^3}-\frac{2b^2Bi^2(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{25g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^6(a+bx)^3(bc-ad)^3}-2B$$

```
[Out] (-2*B^2*d^2*i^2*(c + d*x)^3)/(27*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B^2*d*
i^2*(c + d*x)^4)/(16*(b*c - a*d)^3*g^6*(a + b*x)^4) - (2*b^2*B^2*i^2*(c + d
*x)^5)/(125*(b*c - a*d)^3*g^6*(a + b*x)^5) - (2*B*d^2*i^2*(c + d*x)^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B*d
*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*(b*c - a*d)^3*g^6
*(a + b*x)^4) - (2*b^2*B*i^2*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(25*(b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(c + d*x)^3*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*d*i^2*(c
+ d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^3*g^6*(a +
b*x)^4) - (b^2*i^2*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*(
b*c - a*d)^3*g^6*(a + b*x)^5)
```

Rubi [C] time = 4.21895, antiderivative size = 1009, normalized size of antiderivative = 2.18, number of steps used = 116, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.262, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^2\log^2(a+bx)d^5}{30b^3(bc-ad)^3g^6}+\frac{B^2i^2\log^2(c+dx)d^5}{30b^3(bc-ad)^3g^6}-\frac{47B^2i^2\log(a+bx)d^5}{900b^3(bc-ad)^3g^6}-\frac{Bi^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^5}{15b^3(bc-ad)^3g^6}+\frac{47B^2i^2\log}{900b^3(b}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
6,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^2)/(125*b^3*g^6*(a + b*x)^5) - (7*B^2*d*(b*c - a*d)
*i^2)/(400*b^3*g^6*(a + b*x)^4) + (43*B^2*d^2*i^2)/(2700*b^3*g^6*(a + b*x)^
3) - (13*B^2*d^3*i^2)/(1800*b^3*(b*c - a*d)*g^6*(a + b*x)^2) - (47*B^2*d^4*
i^2)/(900*b^3*(b*c - a*d)^2*g^6*(a + b*x)) - (47*B^2*d^5*i^2*Log[a + b*x])/
(900*b^3*(b*c - a*d)^3*g^6) + (B^2*d^5*i^2*Log[a + b*x]^2)/(30*b^3*(b*c - a
*d)^3*g^6) - (2*B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
25*b^3*g^6*(a + b*x)^5) - (3*B*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(20*b^3*g^6*(a + b*x)^4) - (B*d^2*i^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(45*b^3*g^6*(a + b*x)^3) + (B*d^3*i^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(30*b^3*(b*c - a*d)*g^6*(a + b*x)^2) - (B*d^4*i^2*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(15*b^3*(b*c - a*d)^2*g^6*(a + b*x)) - (B*d^5*i^
2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*b^3*(b*c - a*d)^3*
g^6) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*b^3*g^
6*(a + b*x)^5) - (d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(2*b^3*g^6*(a + b*x)^4) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(3*b^3*g^6*(a + b*x)^3) + (47*B^2*d^5*i^2*Log[c + d*x])/(900*b^3*(b*c - a*
d)^3*g^6) - (B^2*d^5*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(1
5*b^3*(b*c - a*d)^3*g^6) + (B*d^5*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*
Log[c + d*x])/(15*b^3*(b*c - a*d)^3*g^6) + (B^2*d^5*i^2*Log[c + d*x]^2)/(30
*b^3*(b*c - a*d)^3*g^6) - (B^2*d^5*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
- a*d)])/(15*b^3*(b*c - a*d)^3*g^6) - (B^2*d^5*i^2*PolyLog[2, -((d*(a + b*x
```

```
))/(b*c - a*d))])/(15*b^3*(b*c - a*d)^3*g^6) - (B^2*d^5*i^2*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])/(15*b^3*(b*c - a*d)^3*g^6)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(73c+73dx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx = \int \left(\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^2g^6(a+bx)^6} + \frac{10658d(bc-ad)\left(A+B\log\right.}{b^2g^6(a+bx)^5}\right.$$

$$= \frac{(5329d^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}dx}{b^2g^6} + \frac{(10658d(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^5}}{b^2g^6}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{2b^3g^6(a+bx)^4}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{2b^3g^6(a+bx)^4}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{2b^3g^6(a+bx)^4}$$

$$= -\frac{5329(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{5329d(bc-ad)\left(A+B\log\left(\frac{e(}{c}\right.\right.}{2b^3g^6(a+bx)^4}$$

$$= -\frac{10658B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^3g^6(a+bx)^5} - \frac{15987Bd(bc-ad)\left(A+B\log\right.}{20b^3g^6(a+bx)^4}$$

$$= -\frac{10658B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^3g^6(a+bx)^5} - \frac{15987Bd(bc-ad)\left(A+B\log\right.}{20b^3g^6(a+bx)^4}$$

$$= -\frac{10658B(bc-ad)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^3g^6(a+bx)^5} - \frac{15987Bd(bc-ad)\left(A+B\log\right.}{20b^3g^6(a+bx)^4}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2d^2}{2700b^3g^6(a+bx)^3} - \frac{}{1800}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2d^2}{2700b^3g^6(a+bx)^3} - \frac{}{1800}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2d^2}{2700b^3g^6(a+bx)^3} - \frac{}{1800}$$

$$= -\frac{10658B^2(bc-ad)^2}{125b^3g^6(a+bx)^5} - \frac{37303B^2d(bc-ad)}{400b^3g^6(a+bx)^4} + \frac{229147B^2d^2}{2700b^3g^6(a+bx)^3} - \frac{}{1800}$$

Mathematica [C] time = 4.23366, size = 2220, normalized size = 4.79

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^6,x]
```

```
[Out] -(i^2*(10800*(b*c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 27000*d
*(b*c - a*d)^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 18000*d^2
```

```
*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 1000
*B*d^2*(a + b*x)^2*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) -
 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2
*(b*c - a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a +
 b*x)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x
)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^
2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d
*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^
2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3
*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x
)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(
Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[
2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*
x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])) + 375*B*d*(a + b*x)*(36*(b*c - a*d)^4*(A + B*Log[(e*(a +
b*x))/(c + d*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c +
d*x)]) + 144*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d
*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a +
b*x)*Log[c + d*x]) + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*
d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d
*x]) - 8*B*d*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d
^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*
x)^3*Log[c + d*x]) + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x)
+ 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*
d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*
(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
 - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])) + 6*B*(-225*a*B*d*(b*c - a*d)^4 + 144*B*(b*c
 - a*d)^5 - 225*b*B*d*(b*c - a*d)^4*x + 300*a*B*d^2*(b*c - a*d)^3*(a + b*x)
 - 180*B*d*(b*c - a*d)^4*(a + b*x) + 300*b*B*d^2*(b*c - a*d)^3*x*(a + b*x)
- 450*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 + 640*B*d^2*(b*c - a*d)^3*(a + b*x)
^2 - 450*b*B*d^3*(b*c - a*d)^2*x*(a + b*x)^2 + 900*a*B*d^4*(b*c - a*d)*(a +
 b*x)^3 - 1860*B*d^3*(b*c - a*d)^2*(a + b*x)^3 + 900*b*B*d^4*(b*c - a*d)*x*
(a + b*x)^3 + 3600*b*B*c*d^4*(a + b*x)^4 - 3600*a*B*d^5*(a + b*x)^4 + 3720*
B*d^4*(b*c - a*d)*(a + b*x)^4 + 900*a*B*d^5*(a + b*x)^4*Log[a + b*x] + 900*
b*B*d^5*x*(a + b*x)^4*Log[a + b*x] + 7320*B*d^5*(a + b*x)^5*Log[a + b*x] +
720*(b*c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 900*d*(b*c - a*d)^
4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 1200*d^2*(b*c - a*d)^3*(
a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 1800*d^3*(b*c - a*d)^2*(a
 + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 3600*d^4*(b*c - a*d)*(a +
b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 3600*d^5*(a + b*x)^5*Log[a +
b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 900*a*B*d^5*(a + b*x)^4*Log[c +
 d*x] - 900*b*B*d^5*x*(a + b*x)^4*Log[c + d*x] - 7320*B*d^5*(a + b*x)^5*Log
[c + d*x] - 3600*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
 + d*x] - 1800*B*d^5*(a + b*x)^5*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 1800*
B*d^5*(a + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(54000*b^3*(b*c - a
*d)^3*g^6*(a + b*x)^5)
```

Maple [B] time = 0.056, size = 2761, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x)
```

```
[Out] -1/3*e^3*d^2*i^2/(a*d-b*c)^4/g^6*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*
b*c-1/2*e^4*d^2*i^2/(a*d-b*c)^4/g^6*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^4*a+2/25*e^5*d*i^2/(a*d-b*c)^4/g^6*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^5*a+1/5*e^5*d*i^2/(a*d-b*c)^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/4*e^4*d*i^2/(a*d-b*c)^4/g
^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*c+2/25*e^5*d*i^2/(a*d-b*c)^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/3*e^3*d^2*i^2/(a*d-b*c)^4/g^6
*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2*b*c-2/9*e^3*d^2*i^2/(a*d-b*c)^4/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/2*e^4*d^2*i^2/(a*d-b*c)^4/g^6*B^
2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2
*a+1/2*e^4*d*i^2/(a*d-b*c)^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c
)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/4*e^4*d^2*i^2/(a*d-b*c)^4/g^6*B^2
*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-
2/5*e^5*i^2/(a*d-b*c)^4/g^6*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2/3*e^3*d^3*i^2/(a*d-b*c)^4/g^6*A*B/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2/9*e^3*d
^2*i^2/(a*d-b*c)^4/g^6*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-1/4*e^
4*d^2*i^2/(a*d-b*c)^4/g^6*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/4
*e^4*d*i^2/(a*d-b*c)^4/g^6*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+
1/2*e^4*d*i^2/(a*d-b*c)^4/g^6*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4
*c+1/5*e^5*d*i^2/(a*d-b*c)^4/g^6*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c
)^5*a+1/3*e^3*d^3*i^2/(a*d-b*c)^4/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-2/25*e^5*i^2/(a*d-b*c)^4/g^6*A*B*b
^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c-2/27*e^3*d^2*i^2/(a*d-b*c)^4/g^6
*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c-1/16*e^4*d^2*i^2/(a*d-b*c)^4
/g^6*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/16*e^4*d*i^2/(a*d-b*c)
^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+2/125*e^5*d*i^2/(a*d
-b*c)^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+2/5*e^5*d*i^2/(
a*d-b*c)^4/g^6*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*a-2/3*e^3*d^2*i^2/(a*d-b*c)^4/g^6*A*B/(b*e/d+e/(d*x+c)*a-
e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+e^4*d*i^2/(a*d-b*c)^
4/g^6*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*c-e^4*d^2*i^2/(a*d-b*c)^4/g^6*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/3*e^3*d^3*i^2/(a*d-b*c)^4/g^6*A
^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+2/27*e^3*d^3*i^2/(a*d-b*c)^4/g^6
*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-2/125*e^5*i^2/(a*d-b*c)^4/g^6*
B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c-1/5*e^5*i^2/(a*d-b*c)^4/g^6
*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c+2/9*e^3*d^3*i^2/(a*d-b*c)^
4/g^6*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/5*e^5*i^2/(a*d-b*c)^4/g
^6*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2*c-2/25*e^5*i^2/(a*d-b*c)^4/g^6*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2/9*e^3*d^3*i^2/(a*d-b*c)^4/g^6
*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
a
```

Maxima [B] time = 7.22908, size = 14688, normalized size = 31.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
```

```
orithm="maxima")
```

```
[Out] -1/10*(5*b*x + a)*B^2*c*d*i^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^7*g
^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*
b^3*g^6*x + a^5*b^2*g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*d^2*i^2*lo
g(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^
2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1/900
0*(60*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2
- 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*
b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*
b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*
d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c
^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g
^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*
c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^
5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5
*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^
5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d
^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d
^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*
x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3
+ 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
 (144*b^5*c^5 - 1125*a*b^4*c^4*d + 4000*a^2*b^3*c^3*d^2 - 9000*a^3*b^2*c^2*
d^3 + 18000*a^4*b*c*d^4 - 12019*a^5*d^5 + 8220*(b^5*c*d^4 - a*b^4*d^5)*x^4
- 30*(77*b^5*c^2*d^3 - 1250*a*b^4*c*d^4 + 1173*a^2*b^3*d^5)*x^3 + 10*(94*b^
5*c^3*d^2 - 975*a*b^4*c^2*d^3 + 6600*a^2*b^3*c*d^4 - 5719*a^3*b^2*d^5)*x^2
- 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5
*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a)^2 - 1800*(b^5*d^5*x^5 + 5*a*b^
4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d
^5)*log(d*x + c)^2 - 5*(81*b^5*c^4*d - 700*a*b^4*c^3*d^2 + 3000*a^2*b^3*c^2
*d^3 - 10800*a^3*b^2*c*d^4 + 8419*a^4*b*d^5)*x + 8220*(b^5*d^5*x^5 + 5*a*b^
4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d
^5)*log(b*x + a) - 60*(137*b^5*d^5*x^5 + 685*a*b^4*d^5*x^4 + 1370*a^2*b^3*d
^5*x^3 + 1370*a^3*b^2*d^5*x^2 + 685*a^4*b*d^5*x + 137*a^5*d^5 - 60*(b^5*d^5
*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*
d^5*x + a^5*d^5)*log(b*x + a))*log(d*x + c))/(a^5*b^6*c^5*g^6 - 5*a^6*b^5*c
^4*d*g^6 + 10*a^7*b^4*c^3*d^2*g^6 - 10*a^8*b^3*c^2*d^3*g^6 + 5*a^9*b^2*c*d^
4*g^6 - a^10*b*d^5*g^6 + (b^11*c^5*g^6 - 5*a*b^10*c^4*d*g^6 + 10*a^2*b^9*c^
3*d^2*g^6 - 10*a^3*b^8*c^2*d^3*g^6 + 5*a^4*b^7*c*d^4*g^6 - a^5*b^6*d^5*g^6)
*x^5 + 5*(a*b^10*c^5*g^6 - 5*a^2*b^9*c^4*d*g^6 + 10*a^3*b^8*c^3*d^2*g^6 - 1
0*a^4*b^7*c^2*d^3*g^6 + 5*a^5*b^6*c*d^4*g^6 - a^6*b^5*d^5*g^6)*x^4 + 10*(a^
2*b^9*c^5*g^6 - 5*a^3*b^8*c^4*d*g^6 + 10*a^4*b^7*c^3*d^2*g^6 - 10*a^5*b^6*c
^2*d^3*g^6 + 5*a^6*b^5*c*d^4*g^6 - a^7*b^4*d^5*g^6)*x^3 + 10*(a^3*b^8*c^5*g
^6 - 5*a^4*b^7*c^4*d*g^6 + 10*a^5*b^6*c^3*d^2*g^6 - 10*a^6*b^5*c^2*d^3*g^6
+ 5*a^7*b^4*c*d^4*g^6 - a^8*b^3*d^5*g^6)*x^2 + 5*(a^4*b^7*c^5*g^6 - 5*a^5*b
^6*c^4*d*g^6 + 10*a^6*b^5*c^3*d^2*g^6 - 10*a^7*b^4*c^2*d^3*g^6 + 5*a^8*b^3*
c*d^4*g^6 - a^9*b^2*d^5*g^6)*x))*B^2*c^2*i^2 - 1/18000*(60*((27*a*b^4*c^4 -
 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 6
0*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^
2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 -
47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2
- 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*
b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^
2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 +
10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a
^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2
 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*
d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4
 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6
```

) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*
b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60
*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^
3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6))*log(b*e*x
/(d*x + c) + a*e/(d*x + c)) + (549*a*b^5*c^5 - 4625*a^2*b^4*c^4*d + 19000*a
^3*b^3*c^3*d^2 - 63000*a^4*b^2*c^2*d^3 + 51875*a^5*b*c*d^4 - 3799*a^6*d^5 -
 60*(625*b^6*c^2*d^3 - 702*a*b^5*c*d^4 + 77*a^2*b^4*d^5)*x^4 + 30*(325*b^6*
c^3*d^2 - 5667*a*b^5*c^2*d^3 + 5975*a^2*b^4*c*d^4 - 633*a^3*b^3*d^5)*x^3 -
10*(350*b^6*c^4*d - 3949*a*b^5*c^3*d^2 + 29475*a^2*b^4*c^2*d^3 - 28775*a^3*
b^3*c*d^4 + 2899*a^4*b^2*d^5)*x^2 + 1800*(5*a^5*b*c*d^4 - a^6*d^5 + (5*b^6*
c*d^4 - a*b^5*d^5)*x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^4*d^5)*x^4 + 10*(5*a^2*b^
4*c*d^4 - a^3*b^3*d^5)*x^3 + 10*(5*a^3*b^3*c*d^4 - a^4*b^2*d^5)*x^2 + 5*(5*
a^4*b^2*c*d^4 - a^5*b*d^5)*x)*log(b*x + a)^2 + 1800*(5*a^5*b*c*d^4 - a^6*d^
5 + (5*b^6*c*d^4 - a*b^5*d^5)*x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^4*d^5)*x^4 + 1
0*(5*a^2*b^4*c*d^4 - a^3*b^3*d^5)*x^3 + 10*(5*a^3*b^3*c*d^4 - a^4*b^2*d^5)*
x^2 + 5*(5*a^4*b^2*c*d^4 - a^5*b*d^5)*x)*log(d*x + c)^2 + 5*(225*b^6*c^5 -
2201*a*b^5*c^4*d + 10900*a^2*b^4*c^3*d^2 - 46200*a^3*b^3*c^2*d^3 + 41075*a^
4*b^2*c*d^4 - 3799*a^5*b*d^5)*x - 60*(625*a^5*b*c*d^4 - 77*a^6*d^5 + (625*b
^6*c*d^4 - 77*a*b^5*d^5)*x^5 + 5*(625*a*b^5*c*d^4 - 77*a^2*b^4*d^5)*x^4 + 1
0*(625*a^2*b^4*c*d^4 - 77*a^3*b^3*d^5)*x^3 + 10*(625*a^3*b^3*c*d^4 - 77*a^4
*b^2*d^5)*x^2 + 5*(625*a^4*b^2*c*d^4 - 77*a^5*b*d^5)*x)*log(b*x + a) + 60*(
625*a^5*b*c*d^4 - 77*a^6*d^5 + (625*b^6*c*d^4 - 77*a*b^5*d^5)*x^5 + 5*(625*
a*b^5*c*d^4 - 77*a^2*b^4*d^5)*x^4 + 10*(625*a^2*b^4*c*d^4 - 77*a^3*b^3*d^5)
x^3 + 10(625*a^3*b^3*c*d^4 - 77*a^4*b^2*d^5)*x^2 + 5*(625*a^4*b^2*c*d^4 -
 77*a^5*b*d^5)*x - 60*(5*a^5*b*c*d^4 - a^6*d^5 + (5*b^6*c*d^4 - a*b^5*d^5)*
x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^4*d^5)*x^4 + 10*(5*a^2*b^4*c*d^4 - a^3*b^3*d
^5)*x^3 + 10*(5*a^3*b^3*c*d^4 - a^4*b^2*d^5)*x^2 + 5*(5*a^4*b^2*c*d^4 - a^5
*b*d^5)*x)*log(b*x + a))*log(d*x + c))/(a^5*b^7*c^5*g^6 - 5*a^6*b^6*c^4*d*g
^6 + 10*a^7*b^5*c^3*d^2*g^6 - 10*a^8*b^4*c^2*d^3*g^6 + 5*a^9*b^3*c*d^4*g^6
- a^10*b^2*d^5*g^6 + (b^12*c^5*g^6 - 5*a*b^11*c^4*d*g^6 + 10*a^2*b^10*c^3*d
^2*g^6 - 10*a^3*b^9*c^2*d^3*g^6 + 5*a^4*b^8*c*d^4*g^6 - a^5*b^7*d^5*g^6)*x^
5 + 5*(a*b^11*c^5*g^6 - 5*a^2*b^10*c^4*d*g^6 + 10*a^3*b^9*c^3*d^2*g^6 - 10*
a^4*b^8*c^2*d^3*g^6 + 5*a^5*b^7*c*d^4*g^6 - a^6*b^6*d^5*g^6)*x^4 + 10*(a^2*
b^10*c^5*g^6 - 5*a^3*b^9*c^4*d*g^6 + 10*a^4*b^8*c^3*d^2*g^6 - 10*a^5*b^7*c^
2*d^3*g^6 + 5*a^6*b^6*c*d^4*g^6 - a^7*b^5*d^5*g^6)*x^3 + 10*(a^3*b^9*c^5*g^
6 - 5*a^4*b^8*c^4*d*g^6 + 10*a^5*b^7*c^3*d^2*g^6 - 10*a^6*b^6*c^2*d^3*g^6 +
 5*a^7*b^5*c*d^4*g^6 - a^8*b^4*d^5*g^6)*x^2 + 5*(a^4*b^8*c^5*g^6 - 5*a^5*b^
7*c^4*d*g^6 + 10*a^6*b^6*c^3*d^2*g^6 - 10*a^7*b^5*c^2*d^3*g^6 + 5*a^8*b^4*c
*d^4*g^6 - a^9*b^3*d^5*g^6)*x))*B^2*c*d*i^2 - 1/54000*(60*((47*a^2*b^4*c^4
- 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 +
60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d -
95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 -
 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4
)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4
*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*
d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c
^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2
*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6
*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a
^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*
a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a
^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60
*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*
c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3
*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8
*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*
c*d^4 - a^5*b^3*d^5)*g^6))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (1489*a^2
*b^5*c^5 - 14375*a^3*b^4*c^4*d + 85000*a^4*b^3*c^3*d^2 - 85000*a^5*b^2*c^2*
d^3 + 14375*a^6*b*c*d^4 - 1489*a^7*d^5 + 60*(1100*b^7*c^3*d^2 - 1425*a*b^6*

c^2*d^3 + 372*a^2*b^5*c*d^4 - 47*a^3*b^4*d^5)*x^4 - 30*(500*b^7*c^4*d - 982
5*a*b^6*c^3*d^2 + 11937*a^2*b^5*c^2*d^3 - 2975*a^3*b^4*c*d^4 + 363*a^4*b^3*
d^5)*x^3 + 10*(400*b^7*c^5 - 5450*a*b^6*c^4*d + 49189*a^2*b^5*c^3*d^2 - 555
25*a^3*b^4*c^2*d^3 + 12875*a^4*b^3*c*d^4 - 1489*a^5*b^2*d^5)*x^2 - 1800*(10
*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^
4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)
x^4 + 10(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10
*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d
^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x)*log(b*x + a)^2 - 1800*(10*a^5*b^2*c^2*
d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d
^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10
*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*
d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^
2*c*d^4 + a^6*b*d^5)*x)*log(d*x + c)^2 + 5*(925*a*b^6*c^5 - 9911*a^2*b^5*c^
4*d + 67900*a^3*b^4*c^3*d^2 - 71800*a^4*b^3*c^2*d^3 + 14375*a^5*b^2*c*d^4 -
1489*a^6*b*d^5)*x + 60*(1100*a^5*b^2*c^2*d^3 - 325*a^6*b*c*d^4 + 47*a^7*d^
5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x^5 + 5*(1100*a*b
^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 + 10*(1100*a^2*b^5*c^2
*d^3 - 325*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 -
325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^4*b^3*c^2*d^3 - 325*a^
5*b^2*c*d^4 + 47*a^6*b*d^5)*x)*log(b*x + a) - 60*(1100*a^5*b^2*c^2*d^3 - 32
5*a^6*b*c*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b
^5*d^5)*x^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x
^4 + 10*(1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 1
0*(1100*a^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100
*a^4*b^3*c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)*x - 60*(10*a^5*b^2*c^2
*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*
d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(1
0*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2
*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b
^2*c*d^4 + a^6*b*d^5)*x)*log(b*x + a))*log(d*x + c))/(a^5*b^8*c^5*g^6 - 5*a
^6*b^7*c^4*d*g^6 + 10*a^7*b^6*c^3*d^2*g^6 - 10*a^8*b^5*c^2*d^3*g^6 + 5*a^9*
b^4*c*d^4*g^6 - a^10*b^3*d^5*g^6 + (b^13*c^5*g^6 - 5*a*b^12*c^4*d*g^6 + 10*
a^2*b^11*c^3*d^2*g^6 - 10*a^3*b^10*c^2*d^3*g^6 + 5*a^4*b^9*c*d^4*g^6 - a^5*
b^8*d^5*g^6)*x^5 + 5*(a*b^12*c^5*g^6 - 5*a^2*b^11*c^4*d*g^6 + 10*a^3*b^10*c
^3*d^2*g^6 - 10*a^4*b^9*c^2*d^3*g^6 + 5*a^5*b^8*c*d^4*g^6 - a^6*b^7*d^5*g^6
)*x^4 + 10*(a^2*b^11*c^5*g^6 - 5*a^3*b^10*c^4*d*g^6 + 10*a^4*b^9*c^3*d^2*g^
6 - 10*a^5*b^8*c^2*d^3*g^6 + 5*a^6*b^7*c*d^4*g^6 - a^7*b^6*d^5*g^6)*x^3 + 1
0*(a^3*b^10*c^5*g^6 - 5*a^4*b^9*c^4*d*g^6 + 10*a^5*b^8*c^3*d^2*g^6 - 10*a^6
*b^7*c^2*d^3*g^6 + 5*a^7*b^6*c*d^4*g^6 - a^8*b^5*d^5*g^6)*x^2 + 5*(a^4*b^9*
c^5*g^6 - 5*a^5*b^8*c^4*d*g^6 + 10*a^6*b^7*c^3*d^2*g^6 - 10*a^7*b^6*c^2*d^3
*g^6 + 5*a^8*b^5*c*d^4*g^6 - a^9*b^4*d^5*g^6)*x))*B^2*d^2*i^2 - 1/900*A*B*d
^2*i^2*(60*(10*b^2*x^2 + 5*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c)
)/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2
+ 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + (47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 82
2*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a
*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^
2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a
^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4
- 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^
4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 +
a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2
- 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^
3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*
b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d
^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*
b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5
*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b
*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d

```
^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*
c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 1
0*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6
)) - 1/300*A*B*c*d*i^2*(60*(5*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))
/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 +
 5*a^4*b^3*g^6*x + a^5*b^2*g^6) + (27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a
^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4
)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^
5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(1
5*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a
^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*
d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^
2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^
8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(
a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b
^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*
a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7
*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)
*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c
^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d
*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3
 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) - 1/150*A*B*c^2*i^2*((60*b^4*d^4*x^
4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 1
37*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^
3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*
b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2
 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d
+ 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*
c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*
g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4
*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^
4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4
*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*log(b*e
*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g
^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6) + 60*d^5*log(b*x
 + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 +
 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^
5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b
*d^5)*g^6)) - 1/5*B^2*c^2*i^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*g
^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*
b^2*g^6*x + a^5*b*g^6) - 1/10*(5*b*x + a)*A^2*c*d*i^2/(b^7*g^6*x^5 + 5*a*b^
6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5
*b^2*g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*A^2*d^2*i^2/(b^8*g^6*x^5 + 5*
a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x +
 a^5*b^3*g^6) - 1/5*A^2*c^2*i^2/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4
*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6)
```

Fricas [B] time = 0.632417, size = 2804, normalized size = 6.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="fricas")
```

```
[Out] -1/54000*(60*((60*A*B + 47*B^2)*b^5*c*d^4 - (60*A*B + 47*B^2)*a*b^4*d^5)*i^
2*x^4 - 30*((60*A*B - 13*B^2)*b^5*c^2*d^3 - 50*(12*A*B + 7*B^2)*a*b^4*c*d^4
```

```
 + 3*(180*A*B + 121*B^2)*a^2*b^3*d^5)*i^2*x^3 + 10*(2*(900*A^2 + 60*A*B - 4
3*B^2)*b^5*c^3*d^2 - 75*(72*A^2 + 12*A*B - 5*B^2)*a*b^4*c^2*d^3 + 600*(9*A^
2 + 6*A*B + 2*B^2)*a^2*b^3*c*d^4 - (1800*A^2 + 2820*A*B + 1489*B^2)*a^3*b^2
*d^5)*i^2*x^2 + 5*(27*(200*A^2 + 60*A*B + 7*B^2)*b^5*c^4*d - 100*(144*A^2 +
 60*A*B + 11*B^2)*a*b^4*c^3*d^2 + 1200*(9*A^2 + 6*A*B + 2*B^2)*a^2*b^3*c^2*
d^3 - (1800*A^2 + 2820*A*B + 1489*B^2)*a^4*b*d^5)*i^2*x + (432*(25*A^2 + 10
*A*B + 2*B^2)*b^5*c^5 - 3375*(8*A^2 + 4*A*B + B^2)*a*b^4*c^4*d + 2000*(9*A^
2 + 6*A*B + 2*B^2)*a^2*b^3*c^3*d^2 - (1800*A^2 + 2820*A*B + 1489*B^2)*a^5*d
^5)*i^2 + 1800*(B^2*b^5*d^5*i^2*x^5 + 5*B^2*a*b^4*d^5*i^2*x^4 + 10*B^2*a^2*
b^3*d^5*i^2*x^3 + 10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3
*c*d^4)*i^2*x^2 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3*
c^2*d^3)*i^2*x + (6*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3*d
^2)*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 60*((60*A*B + 47*B^2)*b^5*d^5*i^2
*x^5 + 5*(12*B^2*b^5*c*d^4 + 5*(12*A*B + 7*B^2)*a*b^4*d^5)*i^2*x^4 - 10*(3*
B^2*b^5*c^2*d^3 - 30*B^2*a*b^4*c*d^4 - 20*(3*A*B + B^2)*a^2*b^3*d^5)*i^2*x^
3 + 10*(2*(30*A*B + B^2)*b^5*c^3*d^2 - 15*(12*A*B + B^2)*a*b^4*c^2*d^3 + 60
*(3*A*B + B^2)*a^2*b^3*c*d^4)*i^2*x^2 + 5*(9*(20*A*B + 3*B^2)*b^5*c^4*d - 2
0*(24*A*B + 5*B^2)*a*b^4*c^3*d^2 + 120*(3*A*B + B^2)*a^2*b^3*c^2*d^3)*i^2*x
 + (72*(5*A*B + B^2)*b^5*c^5 - 225*(4*A*B + B^2)*a*b^4*c^4*d + 200*(3*A*B +
 B^2)*a^2*b^3*c^3*d^2)*i^2)*log((b*e*x + a*e)/(d*x + c)))/((b^11*c^3 - 3*a*
b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10*c^3 - 3*a^2
*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b^9*c^3 - 3*a
^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3*b^8*c^3 - 3
*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4*b^7*c^3 -
3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b^6*c^3 - 3*a
^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{(bgx+ag)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^6, x)
```

3.74 $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=1089

result too large to display

```
[Out] (5*B^2*(b*c - a*d)^6*g^3*i^3*x)/(84*b^3*d^3) + (B^2*(b*c - a*d)^3*g^3*i^3*(
a + b*x)^4)/(140*b^4) - (29*B^2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2)/(840*b^2
*d^4) + (47*B^2*(b*c - a*d)^4*g^3*i^3*(c + d*x)^3)/(1260*b*d^4) - (13*B^2*(
b*c - a*d)^3*g^3*i^3*(c + d*x)^4)/(420*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i^3*
(c + d*x)^5)/(105*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*Log[(a + b*x)/(c + d*x)
])/(210*b^4*d^4) - (B*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(210*b^4*d) - (3*B*(b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(140*b^4) - (B*(b*c - a*d)^2*g^3*i^3*(a
+ b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(35*b^3) + (2*B*(b
*c - a*d)^4*g^3*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(21*b
*d^4) - (3*B*(b*c - a*d)^3*g^3*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(14*d^4) + (6*b*B*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(35*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*(c + d*x)^6*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(21*d^4) + ((b*c - a*d)^3*g^3*i^3*(a
+ b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(140*b^4) + ((b*c - a*d)^2
*g^3*i^3*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(35*
b^3) + ((b*c - a*d)*g^3*i^3*(a + b*x)^4*(c + d*x)^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/(14*b^2) + (g^3*i^3*(a + b*x)^4*(c + d*x)^3*(A + B*Log[(e*
(a + b*x))/(c + d*x)])^2)/(7*b) + (B*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2*(3*A
 + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(420*b^4*d^2) - (B*(b*c - a*d)^6*
g^3*i^3*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(420*b^4*
d^3) - (B*(b*c - a*d)^7*g^3*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11*B
+ 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(420*b^4*d^4) - (11*B^2*(b*c - a*d)^7*
g^3*i^3*Log[c + d*x])/(420*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(70*b^4*d^4)
```

Rubi [A] time = 4.27025, antiderivative size = 896, normalized size of antiderivative = 0.82, number of steps used = 122, number of rules used = 13, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^3i^3\log^2(c+dx)(bc-ad)^7}{140b^4d^4}-\frac{B^2g^3i^3\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)(bc-ad)^7}{70b^4d^4}+\frac{Bg^3i^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)(}{70b^4d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,
x]
```

```
[Out] -(A*B*(b*c - a*d)^6*g^3*i^3*x)/(70*b^3*d^3) + (B^2*(b*c - a*d)^6*g^3*i^3*x)
/(70*b^3*d^3) - (3*B^2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2)/(280*b^4*d^2) + (
11*B^2*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3)/(1260*b^4*d) + (B^2*(b*c - a*d)^3
*g^3*i^3*(a + b*x)^4)/(42*b^4) + (B^2*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5)/
(105*b^4) - (B^2*(b*c - a*d)^6*g^3*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x
)])/(70*b^4*d^3) + (B*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(140*b^4*d^2) - (B*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/(210*b^4*d) - (17*B*(b*c - a*d)^3*g^3*i^
3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(140*b^4) - (B*d*(b*c -
 a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(7*b^4) -
```

```
(B*d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(21*b^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2)/(4*b^4) + (3*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*Log[(
e*(a + b*x))/(c + d*x)])^2)/(5*b^4) + (d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^4) + (d^3*g^3*i^3*(a + b*x)^7*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(7*b^4) - (B^2*(b*c - a*d)^7*g^3*i^
3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(70*b^4*d^4) + (B*(b*c -
a*d)^7*g^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(70*b^4*d
^4) + (B^2*(b*c - a*d)^7*g^3*i^3*Log[c + d*x]^2)/(140*b^4*d^4) - (B^2*(b*c
- a*d)^7*g^3*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(70*b^4*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (74c+74dx)^3(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int \left(\frac{(-bc+ad)^3g^3(74c+74dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^3} + 3b($$

$$= \frac{(b^3g^3)\int (74c+74dx)^6\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{405224d^3} - (3b^2(bc-$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^4} + 1215$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^4} + 1215$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^4} + 1215$$

$$= -\frac{101306(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^4} + 1215$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{101306B(bc-ad)^5g^3(c+dx)^2(A}{35b^2d^4}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-ad)^6g^3(a+bx)\log}{35b^4d^3}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-ad)^6g^3(a+bx)\log}{35b^4d^3}$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-ad)^6g^3x}{35b^3d^3} + 151959$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-ad)^6g^3x}{35b^3d^3} + 151959$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-ad)^6g^3x}{35b^3d^3} + 151959$$

$$= \frac{202612AB(bc-ad)^6g^3x}{35b^3d^3} + \frac{202612B^2(bc-ad)^6g^3x}{35b^3d^3} + 151959$$

Mathematica [B] time = 3.14045, size = 2330, normalized size = 2.14

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^3*i^3*(35*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2 + 84*d*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2
+ 70*d^2*(b*c - a*d)*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 2
0*d^3*(a + b*x)^7*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (35*B*(b*c - a*d
)^4*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*
```

```
x))/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*
(b*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2
- 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)
*Log[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*
d^4) + (7*B*(b*c - a*d)^3*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*
(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a
*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*
b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3
- 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d
)*Log[c + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
- Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d
^4 - (7*B*(b*c - a*d)^2*(24*b^2*B*c*d*(b*c - a*d)^3*x + 120*A*b*d*(b*c - a*
d)^4*x + 130*b*B*d*(b*c - a*d)^4*x + 24*a*b*B*d^2*(-(b*c) + a*d)^3*x - 12*b
*B*c*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 +
 35*B*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 8*b*B*c*d^3*(b*c - a*d)*(a + b*x)^
3 + 10*B*d^3*(b*c - a*d)^2*(a + b*x)^3 + 8*a*B*d^4*(-(b*c) + a*d)*(a + b*x)
^3 - 6*b*B*c*d^4*(a + b*x)^4 + 6*a*B*d^5*(a + b*x)^4 + 120*B*d*(b*c - a*d)^
4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x
)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*d^5*(a + b*x)^5*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) - 24*b*B*c*(b*c - a*d)^4*Log[c + d*x] + 24*a*B*d*(b*c -
a*d)^4*Log[c + d*x] - 250*B*(b*c - a*d)^5*Log[c + d*x] - 120*(b*c - a*d)^5*
(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 60*B*(b*c - a*d)^5*((2*
Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])))/(6*d^4) + (B*(b*c - a*d)*(60*b^2*B*c*d*(b*
c - a*d)^4*x - 60*a*b*B*d^2*(b*c - a*d)^4*x + 360*A*b*d*(b*c - a*d)^5*x + 4
62*b*B*d*(b*c - a*d)^5*x - 30*b*B*c*d^2*(b*c - a*d)^3*(a + b*x)^2 + 30*a*B*
d^3*(b*c - a*d)^3*(a + b*x)^2 - 141*B*d^2*(b*c - a*d)^4*(a + b*x)^2 + 20*b*
B*c*d^3*(b*c - a*d)^2*(a + b*x)^3 - 20*a*B*d^4*(b*c - a*d)^2*(a + b*x)^3 +
54*B*d^3*(b*c - a*d)^3*(a + b*x)^3 - 15*b*B*c*d^4*(b*c - a*d)*(a + b*x)^4 +
 15*a*B*d^5*(b*c - a*d)*(a + b*x)^4 - 18*B*d^4*(b*c - a*d)^2*(a + b*x)^4 +
12*b*B*c*d^5*(a + b*x)^5 - 12*a*B*d^6*(a + b*x)^5 + 360*B*d*(b*c - a*d)^5*(
a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 180*d^2*(b*c - a*d)^4*(a + b*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 120*d^3*(b*c - a*d)^3*(a + b*x)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]) - 90*d^4*(b*c - a*d)^2*(a + b*x)^4*(A + B
*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^5*(b*c - a*d)*(a + b*x)^5*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) - 60*d^6*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]) - 60*b*B*c*(b*c - a*d)^5*Log[c + d*x] + 60*a*B*d*(b*c - a*d)^5*Log
[c + d*x] - 822*B*(b*c - a*d)^6*Log[c + d*x] - 360*(b*c - a*d)^6*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 180*B*(b*c - a*d)^6*((2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])))/(9*d^4)))/(140*b^4)
```

Maple [F] time = 2.264, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3}(dix+ci)^{3}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)

[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 2.37413, size = 9343, normalized size = 8.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")

[Out] 1/7*A^2*b^3*d^3*g^3*i^3*x^7 + 1/2*A^2*b^3*c*d^2*g^3*i^3*x^6 + 1/2*A^2*a*b^2
*d^3*g^3*i^3*x^6 + 3/5*A^2*b^3*c^2*d*g^3*i^3*x^5 + 9/5*A^2*a*b^2*c*d^2*g^3*
i^3*x^5 + 3/5*A^2*a^2*b*d^3*g^3*i^3*x^5 + 1/4*A^2*b^3*c^3*g^3*i^3*x^4 + 9/4
*A^2*a*b^2*c^2*d*g^3*i^3*x^4 + 9/4*A^2*a^2*b*c*d^2*g^3*i^3*x^4 + 1/4*A^2*a^
3*d^3*g^3*i^3*x^4 + A^2*a*b^2*c^3*g^3*i^3*x^3 + 3*A^2*a^2*b*c^2*d*g^3*i^3*x
^3 + A^2*a^3*c*d^2*g^3*i^3*x^3 + 3/2*A^2*a^2*b*c^3*g^3*i^3*x^2 + 3/2*A^2*a^
3*c^2*d*g^3*i^3*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x
 + a)/b - c*log(d*x + c)/d)*A*B*a^3*c^3*g^3*i^3 + 3*(x^2*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a
*d)*x/(b*d))*A*B*a^2*b*c^3*g^3*i^3 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d
^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b^2*c^3*g^3*i^3 + 1/12*
(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^
4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*c^3*g^3*i^3 + 3*(x^2
*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x
+ c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^3*c^2*d*g^3*i^3 + 3*(2*x^3*log(b*e*x/
(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*
b*c^2*d*g^3*i^3 + 3/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*l
og(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 -
 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*
b^2*c^2*d*g^3*i^3 + 1/10*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*
a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)
*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 -
12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^3*c^2*d*g^3*i^3 + (2*x^3*log(b*e
*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)
/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a
^3*c*d^2*g^3*i^3 + 3/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*
log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3
- 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a
^2*b*c*d^2*g^3*i^3 + 3/10*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12
*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4
)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 -
 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a*b^2*c*d^2*g^3*i^3 + 1/60*(60*x^
6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*l
og(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b
^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^
5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B*b^3*c*d^2*g^3*i^3 + 1/12*
(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^
4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a^3*d^3*g^3*i^3 + 1/10*(
12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*
c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^
```

2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/
(b^4*d^4))*A*B*a^2*b*d^3*g^3*i^3 + 1/60*(60*x^6*log(b*e*x/(d*x + c) + a*e/(
d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*log(d*x + c)/d^6 - (12*(b^5*c*
d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2
 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^
5)*x)/(b^5*d^5))*A*B*a*b^2*d^3*g^3*i^3 + 1/210*(60*x^7*log(b*e*x/(d*x + c)
+ a*e/(d*x + c)) + 60*a^7*log(b*x + a)/b^7 - 60*c^7*log(d*x + c)/d^7 - (10*
(b^6*c*d^5 - a*b^5*d^6)*x^6 - 12*(b^6*c^2*d^4 - a^2*b^4*d^6)*x^5 + 15*(b^6*
c^3*d^3 - a^3*b^3*d^6)*x^4 - 20*(b^6*c^4*d^2 - a^4*b^2*d^6)*x^3 + 30*(b^6*c
^5*d - a^5*b*d^6)*x^2 - 60*(b^6*c^6 - a^6*d^6)*x)/(b^6*d^6))*A*B*b^3*d^3*g^
3*i^3 + A^2*a^3*c^3*g^3*i^3*x + 1/420*(6*b^6*c^7*g^3*i^3*log(e) - 107*a^4*b
^2*c^3*d^4*g^3*i^3 + 39*a^5*b*c^2*d^5*g^3*i^3 - 6*a^6*c*d^6*g^3*i^3 - 6*(7*
g^3*i^3*log(e) - g^3*i^3)*a*b^5*c^6*d + 3*(42*g^3*i^3*log(e) - 13*g^3*i^3)*
a^2*b^4*c^5*d^2 - (210*g^3*i^3*log(e) - 107*g^3*i^3)*a^3*b^3*c^4*d^3)*B^2*l
og(d*x + c)/(b^3*d^4) + 1/70*(b^7*c^7*g^3*i^3 - 7*a*b^6*c^6*d*g^3*i^3 + 21*
a^2*b^5*c^5*d^2*g^3*i^3 - 35*a^3*b^4*c^4*d^3*g^3*i^3 + 35*a^4*b^3*c^3*d^4*g
^3*i^3 - 21*a^5*b^2*c^2*d^5*g^3*i^3 + 7*a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i
^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)
/(b*c - a*d)))*B^2/(b^4*d^4) + 1/2520*(360*B^2*b^7*d^7*g^3*i^3*x^7*log(e)^2
 + 60*((21*g^3*i^3*log(e)^2 - 2*g^3*i^3*log(e))*b^7*c*d^6 + (21*g^3*i^3*log
(e)^2 + 2*g^3*i^3*log(e))*a*b^6*d^7)*B^2*x^6 + 24*((63*g^3*i^3*log(e)^2 - 1
5*g^3*i^3*log(e) + g^3*i^3)*b^7*c^2*d^5 + (189*g^3*i^3*log(e)^2 - 2*g^3*i^3
)*a*b^6*c*d^6 + (63*g^3*i^3*log(e)^2 + 15*g^3*i^3*log(e) + g^3*i^3)*a^2*b^5
*d^7)*B^2*x^5 + 6*((105*g^3*i^3*log(e)^2 - 51*g^3*i^3*log(e) + 10*g^3*i^3)*
b^7*c^3*d^4 + (945*g^3*i^3*log(e)^2 - 147*g^3*i^3*log(e) - 10*g^3*i^3)*a*b^
6*c^2*d^5 + (945*g^3*i^3*log(e)^2 + 147*g^3*i^3*log(e) - 10*g^3*i^3)*a^2*b^
5*c*d^6 + (105*g^3*i^3*log(e)^2 + 51*g^3*i^3*log(e) + 10*g^3*i^3)*a^3*b^4*d
^7)*B^2*x^4 - 2*((6*g^3*i^3*log(e) - 11*g^3*i^3)*b^7*c^4*d^3 - 4*(315*g^3*i
^3*log(e)^2 - 147*g^3*i^3*log(e) + 19*g^3*i^3)*a*b^6*c^3*d^4 - 6*(630*g^3*i
^3*log(e)^2 - 29*g^3*i^3)*a^2*b^5*c^2*d^5 - 4*(315*g^3*i^3*log(e)^2 + 147*g
^3*i^3*log(e) + 19*g^3*i^3)*a^3*b^4*c*d^6 - (6*g^3*i^3*log(e) + 11*g^3*i^3)
*a^4*b^3*d^7)*B^2*x^3 + 3*(3*(2*g^3*i^3*log(e) - 3*g^3*i^3)*b^7*c^5*d^2 - (
42*g^3*i^3*log(e) - 67*g^3*i^3)*a*b^6*c^4*d^3 + 2*(630*g^3*i^3*log(e)^2 - 2
52*g^3*i^3*log(e) - 29*g^3*i^3)*a^2*b^5*c^3*d^4 + 2*(630*g^3*i^3*log(e)^2 +
 252*g^3*i^3*log(e) - 29*g^3*i^3)*a^3*b^4*c^2*d^5 + (42*g^3*i^3*log(e) + 67
*g^3*i^3)*a^4*b^3*c*d^6 - 3*(2*g^3*i^3*log(e) + 3*g^3*i^3)*a^5*b^2*d^7)*B^2
x^2 - 6(6*(g^3*i^3*log(e) - g^3*i^3)*b^7*c^6*d - 3*(14*g^3*i^3*log(e) - 1
5*g^3*i^3)*a*b^6*c^5*d^2 + 2*(63*g^3*i^3*log(e) - 73*g^3*i^3)*a^2*b^5*c^4*d
^3 - 2*(210*g^3*i^3*log(e)^2 - 107*g^3*i^3)*a^3*b^4*c^3*d^4 - 2*(63*g^3*i^3
*log(e) + 73*g^3*i^3)*a^4*b^3*c^2*d^5 + 3*(14*g^3*i^3*log(e) + 15*g^3*i^3)*
a^5*b^2*c*d^6 - 6*(g^3*i^3*log(e) + g^3*i^3)*a^6*b*d^7)*B^2*x + 18*(20*B^2*
b^7*d^7*g^3*i^3*x^7 + 140*B^2*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(b^7*c*d^6*g^3
*i^3 + a*b^6*d^7*g^3*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5*g^3*i^3 + 3*a*b^6*c*d^6
*g^3*i^3 + a^2*b^5*d^7*g^3*i^3)*B^2*x^5 + 35*(b^7*c^3*d^4*g^3*i^3 + 9*a*b^6
*c^2*d^5*g^3*i^3 + 9*a^2*b^5*c*d^6*g^3*i^3 + a^3*b^4*d^7*g^3*i^3)*B^2*x^4 +
 140*(a*b^6*c^3*d^4*g^3*i^3 + 3*a^2*b^5*c^2*d^5*g^3*i^3 + a^3*b^4*c*d^6*g^3
*i^3)*B^2*x^3 + 210*(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2
*x^2 + (35*a^4*b^3*c^3*d^4*g^3*i^3 - 21*a^5*b^2*c^2*d^5*g^3*i^3 + 7*a^6*b*c
*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*B^2)*log(b*x + a)^2 + 18*(20*B^2*b^7*d^7*g^
3*i^3*x^7 + 140*B^2*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(b^7*c*d^6*g^3*i^3 + a*b
^6*d^7*g^3*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5*g^3*i^3 + 3*a*b^6*c*d^6*g^3*i^3 +
 a^2*b^5*d^7*g^3*i^3)*B^2*x^5 + 35*(b^7*c^3*d^4*g^3*i^3 + 9*a*b^6*c^2*d^5*g
^3*i^3 + 9*a^2*b^5*c*d^6*g^3*i^3 + a^3*b^4*d^7*g^3*i^3)*B^2*x^4 + 140*(a*b^
6*c^3*d^4*g^3*i^3 + 3*a^2*b^5*c^2*d^5*g^3*i^3 + a^3*b^4*c*d^6*g^3*i^3)*B^2*
x^3 + 210*(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2*x^2 - (b^
7*c^7*g^3*i^3 - 7*a*b^6*c^6*d*g^3*i^3 + 21*a^2*b^5*c^5*d^2*g^3*i^3 - 35*a^3
*b^4*c^4*d^3*g^3*i^3)*B^2)*log(d*x + c)^2 + 6*(120*B^2*b^7*d^7*g^3*i^3*x^7*
log(e) + 20*((21*g^3*i^3*log(e) - g^3*i^3)*b^7*c*d^6 + (21*g^3*i^3*log(e) +
 g^3*i^3)*a*b^6*d^7)*B^2*x^6 + 12*(126*a*b^6*c*d^6*g^3*i^3*log(e) + (42*g^3

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*i^3*log(e) - 5*g^3*i^3)*b^7*c^2*d^5 + (42*g^3*i^3*log(e) + 5*g^3*i^3)*a^2*
b^5*d^7)*B^2*x^5 + 3*((70*g^3*i^3*log(e) - 17*g^3*i^3)*b^7*c^3*d^4 + 7*(90*
g^3*i^3*log(e) - 7*g^3*i^3)*a*b^6*c^2*d^5 + 7*(90*g^3*i^3*log(e) + 7*g^3*i^
3)*a^2*b^5*c*d^6 + (70*g^3*i^3*log(e) + 17*g^3*i^3)*a^3*b^4*d^7)*B^2*x^4 +
2*(1260*a^2*b^5*c^2*d^5*g^3*i^3*log(e) - b^7*c^4*d^3*g^3*i^3 + a^4*b^3*d^7*
g^3*i^3 + 14*(30*g^3*i^3*log(e) - 7*g^3*i^3)*a*b^6*c^3*d^4 + 14*(30*g^3*i^3
*log(e) + 7*g^3*i^3)*a^3*b^4*c*d^6)*B^2*x^3 + 3*(b^7*c^5*d^2*g^3*i^3 - 7*a*
b^6*c^4*d^3*g^3*i^3 + 7*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3 + 84*(5
*g^3*i^3*log(e) - g^3*i^3)*a^2*b^5*c^3*d^4 + 84*(5*g^3*i^3*log(e) + g^3*i^3
)*a^3*b^4*c^2*d^5)*B^2*x^2 + 6*(140*a^3*b^4*c^3*d^4*g^3*i^3*log(e) - b^7*c^
6*d*g^3*i^3 + 7*a*b^6*c^5*d^2*g^3*i^3 - 21*a^2*b^5*c^4*d^3*g^3*i^3 + 21*a^4
*b^3*c^2*d^5*g^3*i^3 - 7*a^5*b^2*c*d^6*g^3*i^3 + a^6*b*d^7*g^3*i^3)*B^2*x -
 (6*a^7*d^7*g^3*i^3*log(e) + 6*a*b^6*c^6*d*g^3*i^3 - 39*a^2*b^5*c^5*d^2*g^3
*i^3 + 107*a^3*b^4*c^4*d^3*g^3*i^3 - (210*g^3*i^3*log(e) + 107*g^3*i^3)*a^4
*b^3*c^3*d^4 + 3*(42*g^3*i^3*log(e) + 13*g^3*i^3)*a^5*b^2*c^2*d^5 - 6*(7*g^
3*i^3*log(e) + g^3*i^3)*a^6*b*c*d^6)*B^2)*log(b*x + a) - 6*(120*B^2*b^7*d^7
*g^3*i^3*x^7*log(e) + 20*((21*g^3*i^3*log(e) - g^3*i^3)*b^7*c*d^6 + (21*g^3
*i^3*log(e) + g^3*i^3)*a*b^6*d^7)*B^2*x^6 + 12*(126*a*b^6*c*d^6*g^3*i^3*log
(e) + (42*g^3*i^3*log(e) - 5*g^3*i^3)*b^7*c^2*d^5 + (42*g^3*i^3*log(e) + 5*
g^3*i^3)*a^2*b^5*d^7)*B^2*x^5 + 3*((70*g^3*i^3*log(e) - 17*g^3*i^3)*b^7*c^3
*d^4 + 7*(90*g^3*i^3*log(e) - 7*g^3*i^3)*a*b^6*c^2*d^5 + 7*(90*g^3*i^3*log(
e) + 7*g^3*i^3)*a^2*b^5*c*d^6 + (70*g^3*i^3*log(e) + 17*g^3*i^3)*a^3*b^4*d^
7)*B^2*x^4 + 2*(1260*a^2*b^5*c^2*d^5*g^3*i^3*log(e) - b^7*c^4*d^3*g^3*i^3 +
 a^4*b^3*d^7*g^3*i^3 + 14*(30*g^3*i^3*log(e) - 7*g^3*i^3)*a*b^6*c^3*d^4 + 1
4*(30*g^3*i^3*log(e) + 7*g^3*i^3)*a^3*b^4*c*d^6)*B^2*x^3 + 3*(b^7*c^5*d^2*g
^3*i^3 - 7*a*b^6*c^4*d^3*g^3*i^3 + 7*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^
3*i^3 + 84*(5*g^3*i^3*log(e) - g^3*i^3)*a^2*b^5*c^3*d^4 + 84*(5*g^3*i^3*log
(e) + g^3*i^3)*a^3*b^4*c^2*d^5)*B^2*x^2 + 6*(140*a^3*b^4*c^3*d^4*g^3*i^3*lo
g(e) - b^7*c^6*d*g^3*i^3 + 7*a*b^6*c^5*d^2*g^3*i^3 - 21*a^2*b^5*c^4*d^3*g^3
*i^3 + 21*a^4*b^3*c^2*d^5*g^3*i^3 - 7*a^5*b^2*c*d^6*g^3*i^3 + a^6*b*d^7*g^3
*i^3)*B^2*x + 6*(20*B^2*b^7*d^7*g^3*i^3*x^7 + 140*B^2*a^3*b^4*c^3*d^4*g^3*i
^3*x + 70*(b^7*c*d^6*g^3*i^3 + a*b^6*d^7*g^3*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5
*g^3*i^3 + 3*a*b^6*c*d^6*g^3*i^3 + a^2*b^5*d^7*g^3*i^3)*B^2*x^5 + 35*(b^7*c
^3*d^4*g^3*i^3 + 9*a*b^6*c^2*d^5*g^3*i^3 + 9*a^2*b^5*c*d^6*g^3*i^3 + a^3*b^
4*d^7*g^3*i^3)*B^2*x^4 + 140*(a*b^6*c^3*d^4*g^3*i^3 + 3*a^2*b^5*c^2*d^5*g^3
*i^3 + a^3*b^4*c*d^6*g^3*i^3)*B^2*x^3 + 210*(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*
b^4*c^2*d^5*g^3*i^3)*B^2*x^2 + (35*a^4*b^3*c^3*d^4*g^3*i^3 - 21*a^5*b^2*c^2
*d^5*g^3*i^3 + 7*a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*B^2)*log(b*x + a))*
log(d*x + c))/(b^4*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3d^3g^3i^3x^6 + A^2a^3c^3g^3i^3 + 3\left(A^2b^3cd^2 + A^2ab^2d^3\right)g^3i^3x^5 + 3\left(A^2b^3c^2d + 3\,A^2ab^2cd^2 + A^2a^2bd^3\right)g^3i^3x^4 + \left(A\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] integral(A^2*b^3*d^3*g^3*i^3*x^6 + A^2*a^3*c^3*g^3*i^3 + 3*(A^2*b^3*c*d^2 +
 A^2*a*b^2*d^3)*g^3*i^3*x^5 + 3*(A^2*b^3*c^2*d + 3*A^2*a*b^2*c*d^2 + A^2*a^
2*b*d^3)*g^3*i^3*x^4 + (A^2*b^3*c^3 + 9*A^2*a*b^2*c^2*d + 9*A^2*a^2*b*c*d^2
 + A^2*a^3*d^3)*g^3*i^3*x^3 + 3*(A^2*a*b^2*c^3 + 3*A^2*a^2*b*c^2*d + A^2*a^
3*c*d^2)*g^3*i^3*x^2 + 3*(A^2*a^2*b*c^3 + A^2*a^3*c^2*d)*g^3*i^3*x + (B^2*b
^3*d^3*g^3*i^3*x^6 + B^2*a^3*c^3*g^3*i^3 + 3*(B^2*b^3*c*d^2 + B^2*a*b^2*d^3
)*g^3*i^3*x^5 + 3*(B^2*b^3*c^2*d + 3*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*g^3*i
```

```
^3*x^4 + (B^2*b^3*c^3 + 9*B^2*a*b^2*c^2*d + 9*B^2*a^2*b*c*d^2 + B^2*a^3*d^3
)*g^3*i^3*x^3 + 3*(B^2*a*b^2*c^3 + 3*B^2*a^2*b*c^2*d + B^2*a^3*c*d^2)*g^3*i
^3*x^2 + 3*(B^2*a^2*b*c^3 + B^2*a^3*c^2*d)*g^3*i^3*x)*log((b*e*x + a*e)/(d*
x + c))^2 + 2*(A*B*b^3*d^3*g^3*i^3*x^6 + A*B*a^3*c^3*g^3*i^3 + 3*(A*B*b^3*c
*d^2 + A*B*a*b^2*d^3)*g^3*i^3*x^5 + 3*(A*B*b^3*c^2*d + 3*A*B*a*b^2*c*d^2 +
A*B*a^2*b*d^3)*g^3*i^3*x^4 + (A*B*b^3*c^3 + 9*A*B*a*b^2*c^2*d + 9*A*B*a^2*b
*c*d^2 + A*B*a^3*d^3)*g^3*i^3*x^3 + 3*(A*B*a*b^2*c^3 + 3*A*B*a^2*b*c^2*d +
A*B*a^3*c*d^2)*g^3*i^3*x^2 + 3*(A*B*a^2*b*c^3 + A*B*a^3*c^2*d)*g^3*i^3*x)*l
og((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)^3(dix+ci)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

3.75 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=908

$$\frac{B^2g^2i^3\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^6}{36b^4d^3}+\frac{Bg^2i^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2A+3B+2B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)(bc-ad)^6}{60b^4d^3}+\frac{11B^2g^2i^3\log(c+dx)(bc-ad}{180b^4d^3}$$

```
[Out] (-7*B^2*(b*c - a*d)^5*g^2*i^3*x)/(180*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i
^3*(c + d*x)^2)/(360*b^2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(60
*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(60*d^3) + (B^2*(b*c - a*
d)^6*g^2*i^3*Log[(a + b*x)/(c + d*x)])/(36*b^4*d^3) - (B*(b*c - a*d)^4*g^2*
i^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^4*d) - (B*(b*c
- a*d)^3*g^2*i^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^4)
 - (B*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(45*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A +
B*Log[(e*(a + b*x))/(c + d*x)]))/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*(c + d
*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) + ((b*c - a*d)^3*g^2*i
^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(60*b^4) + ((b*c - a
*d)^2*g^2*i^3*(a + b*x)^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(20*b^3) + ((b*c - a*d)*g^2*i^3*(a + b*x)^3*(c + d*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(10*b^2) + (g^2*i^3*(a + b*x)^3*(c + d*x)^3*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)])^2)/(6*b) + (B*(b*c - a*d)^5*g^2*i^3*(a + b*x)*(
2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^4*d^2) + (B*(b*c - a*d)^
6*g^2*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))
/(c + d*x)]))/(60*b^4*d^3) + (11*B^2*(b*c - a*d)^6*g^2*i^3*Log[c + d*x])/(1
80*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*PolyLog[2, (d*(a + b*x))/(b*(c + d
*x))])/(30*b^4*d^3)
```

Rubi [A] time = 3.02211, antiderivative size = 825, normalized size of antiderivative = 0.91, number of steps used = 86, number of rules used = 13, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2g^2i^3\log^2(a+bx)(bc-ad)^6}{60b^4d^3}-\frac{B^2g^2i^3\log(a+bx)(bc-ad)^6}{45b^4d^3}-\frac{Bg^2i^3\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)(bc-ad)^6}{30b^4d^3}+\frac{B^2g^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,
x]
```

```
[Out] -(A*B*(b*c - a*d)^5*g^2*i^3*x)/(30*b^3*d^2) - (B^2*(b*c - a*d)^5*g^2*i^3*x)
/(45*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2)/(360*b^2*d^3) - (
B^2*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*
i^3*(c + d*x)^4)/(60*d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*Log[a + b*x])/(45*b^
4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*Log[a + b*x]^2)/(60*b^4*d^3) - (B^2*(b*
c - a*d)^5*g^2*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(30*b^4*d^2) - (
B*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
60*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(90*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*(c + d*x)^
5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) - (B*(b*c - a*d)^6*g^2*i^3
*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^4*d^3) + ((b*c -
```

```
a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*d^3)
- (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2)/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2)/(6*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*Log[c + d*x])/(30*b^4*d^3) - (B^2*
(b*c - a*d)^6*g^2*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(30*b^4*
d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])
/(30*b^4*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

```
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (75c+75dx)^3(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int\left(\frac{(-bc+ad)^2g^2(75c+75dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} - \ldots\right.$$

$$= \frac{(b^2g^2)\int(75c+75dx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{5625d^2} - \frac{(2b(bc \ldots}{\ldots}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d^3} - \frac{168\ldots}{\ldots}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d^3} - \frac{168\ldots}{\ldots}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d^3} - \frac{168\ldots}{\ldots}$$

$$= \frac{421875(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d^3} - \frac{168\ldots}{\ldots}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{28125B(bc-ad)^4g^2(c+dx)^2\left(\ldots\right.}{4b^2d^3}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{28125B^2(bc-ad)^5g^2(a+bx)\,\mathrm{l}\ldots}{2b^4d^2}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{28125B^2(bc-ad)^5g^2(a+bx)\,\mathrm{l}\ldots}{2b^4d^2}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)^5g^2x}{b^3d^2} - \frac{65625\ldots}{\ldots}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)^5g^2x}{b^3d^2} - \frac{65625\ldots}{\ldots}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)^5g^2x}{b^3d^2} - \frac{65625\ldots}{\ldots}$$

$$= -\frac{28125AB(bc-ad)^5g^2x}{2b^3d^2} - \frac{9375B^2(bc-ad)^5g^2x}{b^3d^2} - \frac{65625\ldots}{\ldots}$$

Mathematica [A] time = 1.34451, size = 1555, normalized size = 1.71

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2,x]
```

```
[Out] (g^2*i^3*(15*(b*c - a*d)^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2 - 24*b*(b*c - a*d)*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
10*b^2*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (5*B*(b*c - a*d
)^3*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a
 + b*x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c -
```

```
a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c +
 d*x)] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
 + 2*b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3
*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[
c + d*x] - 3*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^4 + (2*
B*(b*c - a*d)^2*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c - a*d)^3*(b*d*x + (b*
c - a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x + b^2*(c +
d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2
*x + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Lo
g[a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] +
 12*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8*
b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*b^4*(c
 + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*(b*c - a*d)^4*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x]
- 12*B*(b*c - a*d)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
 - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^4 - (B*(b*c - a
*d)*(120*A*b*d*(b*c - a*d)^4*x - 60*B*(b*c - a*d)^4*(b*d*x + (b*c - a*d)*Lo
g[a + b*x]) - 20*B*(b*c - a*d)^3*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2
*(b*c - a*d)^2*Log[a + b*x]) - 5*B*(b*c - a*d)^2*(6*b*d*(b*c - a*d)^2*x + 3
*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a +
b*x]) - 2*B*(b*c - a*d)*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c +
d*x)^2 + 4*b^3*(b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)
^4*Log[a + b*x]) + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 60*b^2*(b*c - a*d)^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
) + 40*b^3*(b*c - a*d)^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) +
 30*b^4*(b*c - a*d)*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*b
^5*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 120*(b*c - a*d)^5*Log
[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 120*B*(b*c - a*d)^5*Log[c
+ d*x] - 60*B*(b*c - a*d)^5*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x
))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(6*b^4)))/
(60*d^3)
```

Maple [F] time = 2.914, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{2} \left(dix + ci\right)^{3} \left(A + B\ln\left(\frac{e\left(bx + a\right)}{dx + c}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 2.12201, size = 7015, normalized size = 7.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="maxima")
```

```
[Out] 1/6*A^2*b^2*d^3*g^2*i^3*x^6 + 3/5*A^2*b^2*c*d^2*g^2*i^3*x^5 + 2/5*A^2*a*b*d
^3*g^2*i^3*x^5 + 3/4*A^2*b^2*c^2*d*g^2*i^3*x^4 + 3/2*A^2*a*b*c*d^2*g^2*i^3*
```

```
x^4 + 1/4*A^2*a^2*d^3*g^2*i^3*x^4 + 1/3*A^2*b^2*c^3*g^2*i^3*x^3 + 2*A^2*a*b
*c^2*d*g^2*i^3*x^3 + A^2*a^2*c*d^2*g^2*i^3*x^3 + A^2*a*b*c^3*g^2*i^3*x^2 +
3/2*A^2*a^2*c^2*d*g^2*i^3*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
 a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^2*c^3*g^2*i^3 + 2*(x^2*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2
- (b*c - a*d)*x/(b*d))*A*B*a*b*c^3*g^2*i^3 + 1/3*(2*x^3*log(b*e*x/(d*x + c)
 + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2
*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*c^3*g^2*i
^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c
^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*c^2*d*g^2*i^3 + 2*(2*x^3
*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(
d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2
))*A*B*a*b*c^2*d*g^2*i^3 + 1/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c))
- 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d
^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3
))*A*B*b^2*c^2*d*g^2*i^3 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*
a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 -
2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*c*d^2*g^2*i^3 + 1/2*(6*x^4*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x +
 c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 +
6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b*c*d^2*g^2*i^3 + 1/10*(12*x^5*lo
g(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d
*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4
)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)
)*A*B*b^2*c*d^2*g^2*i^3 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c))
- 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d
^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3
))*A*B*a^2*d^3*g^2*i^3 + 1/15*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c))
+ 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3
*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x
^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a*b*d^3*g^2*i^3 + 1/180*(60*x
^6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*
log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*
b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d
^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B*b^2*d^3*g^2*i^3 + A^2*a^
2*c^3*g^2*i^3*x - 1/180*(74*a^3*b^2*c^3*d^3*g^2*i^3 - 33*a^4*b*c^2*d^4*g^2*
i^3 + 6*a^5*c*d^5*g^2*i^3 + 2*(3*g^2*i^3*log(e) - g^2*i^3)*b^5*c^6 - 18*(2*
g^2*i^3*log(e) - g^2*i^3)*a*b^4*c^5*d + 9*(10*g^2*i^3*log(e) - 7*g^2*i^3)*a
^2*b^3*c^4*d^2)*B^2*log(d*x + c)/(b^3*d^3) - 1/30*(b^6*c^6*g^2*i^3 - 6*a*b^
5*c^5*d*g^2*i^3 + 15*a^2*b^4*c^4*d^2*g^2*i^3 - 20*a^3*b^3*c^3*d^3*g^2*i^3 +
 15*a^4*b^2*c^2*d^4*g^2*i^3 - 6*a^5*b*c*d^5*g^2*i^3 + a^6*d^6*g^2*i^3)*(log
(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c -
a*d)))*B^2/(b^4*d^3) + 1/360*(60*B^2*b^6*d^6*g^2*i^3*x^6*log(e)^2 + 24*((9*
g^2*i^3*log(e)^2 - g^2*i^3*log(e))*b^6*c*d^5 + (6*g^2*i^3*log(e)^2 + g^2*i^
3*log(e))*a*b^5*d^6)*B^2*x^5 + 6*((45*g^2*i^3*log(e)^2 - 13*g^2*i^3*log(e)
+ g^2*i^3)*b^6*c^2*d^4 + 2*(45*g^2*i^3*log(e)^2 + 3*g^2*i^3*log(e) - g^2*i^
3)*a*b^5*c*d^5 + (15*g^2*i^3*log(e)^2 + 7*g^2*i^3*log(e) + g^2*i^3)*a^2*b^4
*d^6)*B^2*x^4 + 2*((60*g^2*i^3*log(e)^2 - 38*g^2*i^3*log(e) + 9*g^2*i^3)*b^
6*c^3*d^3 + 3*(120*g^2*i^3*log(e)^2 - 14*g^2*i^3*log(e) - 5*g^2*i^3)*a*b^5*
c^2*d^4 + 3*(60*g^2*i^3*log(e)^2 + 26*g^2*i^3*log(e) + g^2*i^3)*a^2*b^4*c*d
^5 + (2*g^2*i^3*log(e) + 3*g^2*i^3)*a^3*b^3*d^6)*B^2*x^3 - ((6*g^2*i^3*log(
e) - 11*g^2*i^3)*b^6*c^4*d^2 - 2*(180*g^2*i^3*log(e)^2 - 102*g^2*i^3*log(e)
 + 5*g^2*i^3)*a*b^5*c^3*d^3 - 60*(9*g^2*i^3*log(e)^2 + 3*g^2*i^3*log(e) - g
^2*i^3)*a^2*b^4*c^2*d^4 - 2*(18*g^2*i^3*log(e) + 23*g^2*i^3)*a^3*b^3*c*d^5
+ (6*g^2*i^3*log(e) + 7*g^2*i^3)*a^4*b^2*d^6)*B^2*x^2 + 2*(2*(3*g^2*i^3*log
(e) - 4*g^2*i^3)*b^6*c^5*d - 3*(12*g^2*i^3*log(e) - 17*g^2*i^3)*a*b^5*c^4*d
^2 + (180*g^2*i^3*log(e)^2 - 30*g^2*i^3*log(e) - 97*g^2*i^3)*a^2*b^4*c^3*d^
3 + (90*g^2*i^3*log(e) + 77*g^2*i^3)*a^3*b^3*c^2*d^4 - 9*(4*g^2*i^3*log(e)
+ 3*g^2*i^3)*a^4*b^2*c*d^5 + 2*(3*g^2*i^3*log(e) + 2*g^2*i^3)*a^5*b*d^6)*B^
```

```
2*x + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^4*c^3*d^3*g^2*i^3*x + 12
*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^5 + 15*(3*b^6*c^2*d^4*g^
2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3)*B^2*x^4 + 20*(b^6*c^3*
d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c*d^5*g^2*i^3)*B^2*x^3 +
30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2*i^3)*B^2*x^2 + (20*a^3*
b^3*c^3*d^3*g^2*i^3 - 15*a^4*b^2*c^2*d^4*g^2*i^3 + 6*a^5*b*c*d^5*g^2*i^3 -
a^6*d^6*g^2*i^3)*B^2)*log(b*x + a)^2 + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B
^2*a^2*b^4*c^3*d^3*g^2*i^3*x + 12*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^
3)*B^2*x^5 + 15*(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^
6*g^2*i^3)*B^2*x^4 + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*
a^2*b^4*c*d^5*g^2*i^3)*B^2*x^3 + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^
2*d^4*g^2*i^3)*B^2*x^2 + (b^6*c^6*g^2*i^3 - 6*a*b^5*c^5*d*g^2*i^3 + 15*a^2*
b^4*c^4*d^2*g^2*i^3)*B^2)*log(d*x + c)^2 + 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*lo
g(e) + 12*((18*g^2*i^3*log(e) - g^2*i^3)*b^6*c*d^5 + (12*g^2*i^3*log(e) + g
^2*i^3)*a*b^5*d^6)*B^2*x^5 + 3*((90*g^2*i^3*log(e) - 13*g^2*i^3)*b^6*c^2*d^
4 + 6*(30*g^2*i^3*log(e) + g^2*i^3)*a*b^5*c*d^5 + (30*g^2*i^3*log(e) + 7*g^
2*i^3)*a^2*b^4*d^6)*B^2*x^4 + 2*(a^3*b^3*d^6*g^2*i^3 + (60*g^2*i^3*log(e) -
 19*g^2*i^3)*b^6*c^3*d^3 + 3*(120*g^2*i^3*log(e) - 7*g^2*i^3)*a*b^5*c^2*d^4
 + 3*(60*g^2*i^3*log(e) + 13*g^2*i^3)*a^2*b^4*c*d^5)*B^2*x^3 - 3*(b^6*c^4*d
^2*g^2*i^3 - 6*a^3*b^3*c*d^5*g^2*i^3 + a^4*b^2*d^6*g^2*i^3 - 2*(60*g^2*i^3*
log(e) - 17*g^2*i^3)*a*b^5*c^3*d^3 - 30*(6*g^2*i^3*log(e) + g^2*i^3)*a^2*b^
4*c^2*d^4)*B^2*x^2 + 6*(b^6*c^5*d*g^2*i^3 - 6*a*b^5*c^4*d^2*g^2*i^3 + 15*a^
3*b^3*c^2*d^4*g^2*i^3 - 6*a^4*b^2*c*d^5*g^2*i^3 + a^5*b*d^6*g^2*i^3 + 5*(12
*g^2*i^3*log(e) - g^2*i^3)*a^2*b^4*c^3*d^3)*B^2*x + (6*a*b^5*c^5*d*g^2*i^3
- 33*a^2*b^4*c^4*d^2*g^2*i^3 + 2*(60*g^2*i^3*log(e) + 17*g^2*i^3)*a^3*b^3*c
^3*d^3 - 3*(30*g^2*i^3*log(e) + g^2*i^3)*a^4*b^2*c^2*d^4 + 6*(6*g^2*i^3*log
(e) - g^2*i^3)*a^5*b*c*d^5 - 2*(3*g^2*i^3*log(e) - g^2*i^3)*a^6*d^6)*B^2)*l
og(b*x + a) - 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*log(e) + 12*((18*g^2*i^3*log(e)
 - g^2*i^3)*b^6*c*d^5 + (12*g^2*i^3*log(e) + g^2*i^3)*a*b^5*d^6)*B^2*x^5 +
3*((90*g^2*i^3*log(e) - 13*g^2*i^3)*b^6*c^2*d^4 + 6*(30*g^2*i^3*log(e) + g^
2*i^3)*a*b^5*c*d^5 + (30*g^2*i^3*log(e) + 7*g^2*i^3)*a^2*b^4*d^6)*B^2*x^4 +
 2*(a^3*b^3*d^6*g^2*i^3 + (60*g^2*i^3*log(e) - 19*g^2*i^3)*b^6*c^3*d^3 + 3*
(120*g^2*i^3*log(e) - 7*g^2*i^3)*a*b^5*c^2*d^4 + 3*(60*g^2*i^3*log(e) + 13*
g^2*i^3)*a^2*b^4*c*d^5)*B^2*x^3 - 3*(b^6*c^4*d^2*g^2*i^3 - 6*a^3*b^3*c*d^5*
g^2*i^3 + a^4*b^2*d^6*g^2*i^3 - 2*(60*g^2*i^3*log(e) - 17*g^2*i^3)*a*b^5*c^
3*d^3 - 30*(6*g^2*i^3*log(e) + g^2*i^3)*a^2*b^4*c^2*d^4)*B^2*x^2 + 6*(b^6*c
^5*d*g^2*i^3 - 6*a*b^5*c^4*d^2*g^2*i^3 + 15*a^3*b^3*c^2*d^4*g^2*i^3 - 6*a^4
*b^2*c*d^5*g^2*i^3 + a^5*b*d^6*g^2*i^3 + 5*(12*g^2*i^3*log(e) - g^2*i^3)*a^
2*b^4*c^3*d^3)*B^2*x + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^4*c^3*d
^3*g^2*i^3*x + 12*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^5 + 15*
(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3)*B^2*x
^4 + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c*d^5*g^
2*i^3)*B^2*x^3 + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2*i^3)*B
^2*x^2 + (20*a^3*b^3*c^3*d^3*g^2*i^3 - 15*a^4*b^2*c^2*d^4*g^2*i^3 + 6*a^5*b
*c*d^5*g^2*i^3 - a^6*d^6*g^2*i^3)*B^2)*log(b*x + a))*log(d*x + c))/(b^4*d^3
)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2d^3g^2i^3x^5 + A^2a^2c^3g^2i^3 + \left(3\,A^2b^2cd^2 + 2\,A^2abd^3\right)g^2i^3x^4 + \left(3\,A^2b^2c^2d + 6\,A^2abcd^2 + A^2a^2d^3\right)g^2i^3x^3 + \left(A^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] integral(A^2*b^2*d^3*g^2*i^3*x^5 + A^2*a^2*c^3*g^2*i^3 + (3*A^2*b^2*c*d^2 +
 2*A^2*a*b*d^3)*g^2*i^3*x^4 + (3*A^2*b^2*c^2*d + 6*A^2*a*b*c*d^2 + A^2*a^2*
d^3)*g^2*i^3*x^3 + (A^2*b^2*c^3 + 6*A^2*a*b*c^2*d + 3*A^2*a^2*c*d^2)*g^2*i^
3*x^2 + (2*A^2*a*b*c^3 + 3*A^2*a^2*c^2*d)*g^2*i^3*x + (B^2*b^2*d^3*g^2*i^3*
x^5 + B^2*a^2*c^3*g^2*i^3 + (3*B^2*b^2*c*d^2 + 2*B^2*a*b*d^3)*g^2*i^3*x^4 +
 (3*B^2*b^2*c^2*d + 6*B^2*a*b*c*d^2 + B^2*a^2*d^3)*g^2*i^3*x^3 + (B^2*b^2*c
^3 + 6*B^2*a*b*c^2*d + 3*B^2*a^2*c*d^2)*g^2*i^3*x^2 + (2*B^2*a*b*c^3 + 3*B^
2*a^2*c^2*d)*g^2*i^3*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^2*d^3*g^2
*i^3*x^5 + A*B*a^2*c^3*g^2*i^3 + (3*A*B*b^2*c*d^2 + 2*A*B*a*b*d^3)*g^2*i^3*
x^4 + (3*A*B*b^2*c^2*d + 6*A*B*a*b*c*d^2 + A*B*a^2*d^3)*g^2*i^3*x^3 + (A*B*
b^2*c^3 + 6*A*B*a*b*c^2*d + 3*A*B*a^2*c*d^2)*g^2*i^3*x^2 + (2*A*B*a*b*c^3 +
 3*A*B*a^2*c^2*d)*g^2*i^3*x)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^3 \left(B \log \left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A
)^2, x)
```

3.76 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=730

$$-\frac{B^2gi^3(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{10b^4d^2}-\frac{Bgi^3(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{10b^4d^2}+\frac{3Bgi^3(c+dx)^2(bc-ad)^3}{20b^2}$$

```
[Out] (B^2*(b*c - a*d)^4*g*i^3*x)/(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*(c + d*x)
^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g*i^3*(c + d*x)^3)/(30*b*d^2) - (B^2*
(b*c - a*d)^5*g*i^3*Log[(a + b*x)/(c + d*x)])/(12*b^4*d^2) - (B*(b*c - a*d)
^4*g*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4*d) - (B*(b
*c - a*d)^3*g*i^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4
) + (3*B*(b*c - a*d)^3*g*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(30*b*d^2) - (B*(b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(10*d^2) + ((b*c - a*d)^3*g*i^3*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2)/(20*b^4) + ((b*c - a*d)^2*g*i^3*(a + b*x
)^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(10*b^3) + (3*(b*c -
a*d)*g*i^3*(a + b*x)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(20*b^2) + (g*i^3*(a + b*x)^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2)/(5*b) - (B*(b*c - a*d)^5*g*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4*d^2) - (11*B^2*(b*c - a*d)^5*g*
i^3*Log[c + d*x])/(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*PolyLog[2, (d*(a
+ b*x))/(b*(c + d*x))])/(10*b^4*d^2)
```

Rubi [A] time = 1.7813, antiderivative size = 655, normalized size of antiderivative = 0.9, number of steps used = 54, number of rules used = 13, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.325, Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2gi^3(bc-ad)^5\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{10b^4d^2}+\frac{Bgi^3(bc-ad)^5\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{10b^4d^2}+\frac{Bgi^3(c+dx)^2(bc-ad)^3\left(B\log\right.}{20b^2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (A*B*(b*c - a*d)^4*g*i^3*x)/(10*b^3*d) + (B^2*(b*c - a*d)^4*g*i^3*x)/(60*b^
3*d) + (B^2*(b*c - a*d)^3*g*i^3*(c + d*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d
)^2*g*i^3*(c + d*x)^3)/(30*b*d^2) + (B^2*(b*c - a*d)^5*g*i^3*Log[a + b*x])/
(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*Log[a + b*x]^2)/(20*b^4*d^2) + (B^2
*(b*c - a*d)^4*g*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(10*b^4*d) + (
B*(b*c - a*d)^3*g*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20
*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(30*b*d^2) - (B*(b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(10*d^2) + (B*(b*c - a*d)^5*g*i^3*Log[a + b*x]*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(10*b^4*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*d^2) - (B^2*(b*c - a*d)^5*g*i^3*Log[
c + d*x])/(10*b^4*d^2) + (B^2*(b*c - a*d)^5*g*i^3*Log[a + b*x]*Log[(b*(c +
d*x))/(b*c - a*d)])/(10*b^4*d^2) + (B^2*(b*c - a*d)^5*g*i^3*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))])/(10*b^4*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (76c+76dx)^3(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \int \left(\frac{(-bc+ad)g(76c+76dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d} + \frac{bg(\right.$$

$$= \frac{(bg)\int (76c+76dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{76d} + \frac{((-bc+a}{}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{4389}{}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{4389}{}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{4389}{}$$

$$= -\frac{109744(bc-ad)g(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2} + \frac{4389}{}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B(bc-ad)^3g(c+dx)^2\left(A\right.}{5b^2d^2}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{219488B^2(bc-ad)^4g(a+bx)\log}{5b^4d}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{219488B^2(bc-ad)^4g(a+bx)\log}{5b^4d}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ad)^4gx}{15b^3d} + \frac{21948}{}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ad)^4gx}{15b^3d} + \frac{21948}{}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ad)^4gx}{15b^3d} + \frac{21948}{}$$

$$= \frac{219488AB(bc-ad)^4gx}{5b^3d} + \frac{109744B^2(bc-ad)^4gx}{15b^3d} + \frac{21948}{}$$

Mathematica [A] time = 0.705887, size = 901, normalized size = 1.23

$$\frac{gi^3\left(4b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(c+dx)^5 - 5(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2(c+dx)^4 + \frac{5B(bc-ad)^2\left(6\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2,x]
```

```
[Out] (g*i^3*(-5*(b*c - a*d)*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 +
 4*b*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (5*B*(b*c - a*d)^
2*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a +
```

```
b*x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*
d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) +
 2*b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3*L
og[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c
+ d*x] - 3*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(3*b^4) - (
B*(b*c - a*d)*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c - a*d)^3*(b*d*x + (b*c
- a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x + b^2*(c + d*
x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x
 + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[
a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 1
2*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8*b^
3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*b^4*(c +
 d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*(b*c - a*d)^4*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] -
12*B*(b*c - a*d)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(3*b^4)))/(20*d^2)
```

Maple [F] time = 2.556, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)(dix+ci)^3\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 2.00911, size = 4344, normalized size = 5.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] 1/5*A^2*b*d^3*g*i^3*x^5 + 3/4*A^2*b*c*d^2*g*i^3*x^4 + 1/4*A^2*a*d^3*g*i^3*x
^4 + A^2*b*c^2*d*g*i^3*x^3 + A^2*a*c*d^2*g*i^3*x^3 + 1/2*A^2*b*c^3*g*i^3*x^
2 + 3/2*A^2*a*c^2*d*g*i^3*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
 a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a*c^3*g*i^3 + (x^2*log(b*e*x/(d*x
 + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c
 - a*d)*x/(b*d))*A*B*b*c^3*g*i^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x +
c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*
B*a*c^2*d*g*i^3 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b*c^2*d*g*i^3 + (2*x^3*log(b*e*x/(d*x + c) +
 a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c
*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*c*d^2*g*i^3 +
 1/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 +
 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a
^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b*c*d^2*g*i^3 + 1/1
```

```
2*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*
c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*
b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*d^3*g*i^3 + 1/30*(12
*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^
5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*
b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b
^4*d^4))*A*B*b*d^3*g*i^3 + A^2*a*c^3*g*i^3*x - 1/60*(47*a^2*b^2*c^3*d^2*g*i
^3 - 27*a^3*b*c^2*d^3*g*i^3 + 6*a^4*c*d^4*g*i^3 - (6*g*i^3*log(e) - 5*g*i^3
)*b^4*c^5 + (30*g*i^3*log(e) - 31*g*i^3)*a*b^3*c^4*d)*B^2*log(d*x + c)/(b^3
*d^2) + 1/10*(b^5*c^5*g*i^3 - 5*a*b^4*c^4*d*g*i^3 + 10*a^2*b^3*c^3*d^2*g*i^
3 - 10*a^3*b^2*c^2*d^3*g*i^3 + 5*a^4*b*c*d^4*g*i^3 - a^5*d^5*g*i^3)*(log(b*
x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d
)))*B^2/(b^4*d^2) + 1/60*(12*B^2*b^5*d^5*g*i^3*x^5*log(e)^2 + 3*((15*g*i^3*
log(e)^2 - 2*g*i^3*log(e))*b^5*c*d^4 + (5*g*i^3*log(e)^2 + 2*g*i^3*log(e))*
a*b^4*d^5)*B^2*x^4 + 2*((30*g*i^3*log(e)^2 - 11*g*i^3*log(e) + g*i^3)*b^5*c
^2*d^3 + 2*(15*g*i^3*log(e)^2 + 5*g*i^3*log(e) - g*i^3)*a*b^4*c*d^4 + (g*i^
3*log(e) + g*i^3)*a^2*b^3*d^5)*B^2*x^3 + ((30*g*i^3*log(e)^2 - 27*g*i^3*log
(e) + 8*g*i^3)*b^5*c^3*d^2 + 3*(30*g*i^3*log(e)^2 + 5*g*i^3*log(e) - 6*g*i^
3)*a*b^4*c^2*d^3 + 3*(5*g*i^3*log(e) + 4*g*i^3)*a^2*b^3*c*d^4 - (3*g*i^3*lo
g(e) + 2*g*i^3)*a^3*b^2*d^5)*B^2*x^2 - ((6*g*i^3*log(e) - 11*g*i^3)*b^5*c^4
*d - 2*(30*g*i^3*log(e)^2 - 15*g*i^3*log(e) - 14*g*i^3)*a*b^4*c^3*d^2 - 12*
(5*g*i^3*log(e) + 2*g*i^3)*a^2*b^3*c^2*d^3 + 2*(15*g*i^3*log(e) + 4*g*i^3)*
a^3*b^2*c*d^4 - (6*g*i^3*log(e) + g*i^3)*a^4*b*d^5)*B^2*x + 3*(4*B^2*b^5*d^
5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d
^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10
*(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2 + (10*a^2*b^3*c^3*d^2*
g*i^3 - 10*a^3*b^2*c^2*d^3*g*i^3 + 5*a^4*b*c*d^4*g*i^3 - a^5*d^5*g*i^3)*B^2
)*log(b*x + a)^2 + 3*(4*B^2*b^5*d^5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*
x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3
 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10*(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i
^3)*B^2*x^2 - (b^5*c^5*g*i^3 - 5*a*b^4*c^4*d*g*i^3)*B^2)*log(d*x + c)^2 + (
24*B^2*b^5*d^5*g*i^3*x^5*log(e) + 6*((15*g*i^3*log(e) - g*i^3)*b^5*c*d^4 +
(5*g*i^3*log(e) + g*i^3)*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g*i^3 + (60*g*
i^3*log(e) - 11*g*i^3)*b^5*c^2*d^3 + 10*(6*g*i^3*log(e) + g*i^3)*a*b^4*c*d^
4)*B^2*x^3 + 3*(5*a^2*b^3*c*d^4*g*i^3 - a^3*b^2*d^5*g*i^3 + (20*g*i^3*log(e
) - 9*g*i^3)*b^5*c^3*d^2 + 5*(12*g*i^3*log(e) + g*i^3)*a*b^4*c^2*d^3)*B^2*x
^2 - 6*(b^5*c^4*d*g*i^3 - 10*a^2*b^3*c^2*d^3*g*i^3 + 5*a^3*b^2*c*d^4*g*i^3
- a^4*b*d^5*g*i^3 - 5*(4*g*i^3*log(e) - g*i^3)*a*b^4*c^3*d^2)*B^2*x - (6*a*
b^4*c^4*d*g*i^3 - 3*(20*g*i^3*log(e) - g*i^3)*a^2*b^3*c^3*d^2 + (60*g*i^3*l
og(e) - 23*g*i^3)*a^3*b^2*c^2*d^3 - (30*g*i^3*log(e) - 19*g*i^3)*a^4*b*c*d^
4 + (6*g*i^3*log(e) - 5*g*i^3)*a^5*d^5)*B^2)*log(b*x + a) - (24*B^2*b^5*d^5
*g*i^3*x^5*log(e) + 6*((15*g*i^3*log(e) - g*i^3)*b^5*c*d^4 + (5*g*i^3*log(e
) + g*i^3)*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g*i^3 + (60*g*i^3*log(e) - 1
1*g*i^3)*b^5*c^2*d^3 + 10*(6*g*i^3*log(e) + g*i^3)*a*b^4*c*d^4)*B^2*x^3 + 3
*(5*a^2*b^3*c*d^4*g*i^3 - a^3*b^2*d^5*g*i^3 + (20*g*i^3*log(e) - 9*g*i^3)*b
^5*c^3*d^2 + 5*(12*g*i^3*log(e) + g*i^3)*a*b^4*c^2*d^3)*B^2*x^2 - 6*(b^5*c^
4*d*g*i^3 - 10*a^2*b^3*c^2*d^3*g*i^3 + 5*a^3*b^2*c*d^4*g*i^3 - a^4*b*d^5*g*
i^3 - 5*(4*g*i^3*log(e) - g*i^3)*a*b^4*c^3*d^2)*B^2*x + 6*(4*B^2*b^5*d^5*g*
i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d^5*g
*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10*(b^
5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2 + (10*a^2*b^3*c^3*d^2*g*i^
3 - 10*a^3*b^2*c^2*d^3*g*i^3 + 5*a^4*b*c*d^4*g*i^3 - a^5*d^5*g*i^3)*B^2)*lo
g(b*x + a))*log(d*x + c))/(b^4*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\Bigg(A^2bd^3gi^3x^4 + A^2ac^3gi^3 + \left(3\,A^2bcd^2 + A^2ad^3\right)gi^3x^3 + 3\left(A^2bc^2d + A^2acd^2\right)gi^3x^2 + \left(A^2bc^3 + 3\,A^2ac^2d\right)gi^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")
```

```
[Out] integral(A^2*b*d^3*g*i^3*x^4 + A^2*a*c^3*g*i^3 + (3*A^2*b*c*d^2 + A^2*a*d^3
)*g*i^3*x^3 + 3*(A^2*b*c^2*d + A^2*a*c*d^2)*g*i^3*x^2 + (A^2*b*c^3 + 3*A^2*
a*c^2*d)*g*i^3*x + (B^2*b*d^3*g*i^3*x^4 + B^2*a*c^3*g*i^3 + (3*B^2*b*c*d^2
+ B^2*a*d^3)*g*i^3*x^3 + 3*(B^2*b*c^2*d + B^2*a*c*d^2)*g*i^3*x^2 + (B^2*b*c
^3 + 3*B^2*a*c^2*d)*g*i^3*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b*d^3*
g*i^3*x^4 + A*B*a*c^3*g*i^3 + (3*A*B*b*c*d^2 + A*B*a*d^3)*g*i^3*x^3 + 3*(A*
B*b*c^2*d + A*B*a*c*d^2)*g*i^3*x^2 + (A*B*b*c^3 + 3*A*B*a*c^2*d)*g*i^3*x)*l
og((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)(dix+ci)^3 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

3.77 $\int (ci+dix)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=420

$$-\frac{B^2i^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{2b^4d}+\frac{Bi^3(bc-ad)^4\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^4d}-\frac{Bi^3(a+bx)(bc-ad)^3\left(B\right.}{2b^4}$$

```
[Out] (5*B^2*(b*c - a*d)^3*i^3*x)/(12*b^3) + (B^2*(b*c - a*d)^2*i^3*(c + d*x)^2)/
(12*b^2*d) + (5*B^2*(b*c - a*d)^4*i^3*Log[(a + b*x)/(c + d*x)])/(12*b^4*d)
- (B*(b*c - a*d)^3*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b
^4) - (B*(b*c - a*d)^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(4*b^2*d) - (B*(b*c - a*d)*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)]))/(6*b*d) + (i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(4*d) + (11*B^2*(b*c - a*d)^4*i^3*Log[c + d*x])/(12*b^4*d) + (B*(b*c - a*d)
^4*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b
*x))])/(2*b^4*d) - (B^2*(b*c - a*d)^4*i^3*PolyLog[2, (b*(c + d*x))/(d*(a +
b*x))])/(2*b^4*d)
```

Rubi [A] time = 0.616502, antiderivative size = 503, normalized size of antiderivative = 1.2, number of steps used = 24, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{B^2i^3(bc-ad)^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2b^4d}-\frac{Bi^3(bc-ad)^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b^4d}-\frac{Bi^3(c+dx)^2(bc-ad)^2\left(B\,\mathrm{lo}\right.}{4b^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*i^3*x)/(2*b^3) + (5*B^2*(b*c - a*d)^3*i^3*x)/(12*b^3) +
 (B^2*(b*c - a*d)^2*i^3*(c + d*x)^2)/(12*b^2*d) + (5*B^2*(b*c - a*d)^4*i^3*
Log[a + b*x])/(12*b^4*d) + (B^2*(b*c - a*d)^4*i^3*Log[a + b*x]^2)/(4*b^4*d)
 - (B^2*(b*c - a*d)^3*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(2*b^4) -
 (B*(b*c - a*d)^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*
b^2*d) - (B*(b*c - a*d)*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(6*b*d) - (B*(b*c - a*d)^4*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(2*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2)/(4*d) + (B^2*(b*c - a*d)^4*i^3*Log[c + d*x])/(2*b^4*d) - (B^2*(b*c - a*
d)^4*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(2*b^4*d) - (B^2*(b*c
 - a*d)^4*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(2*b^4*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (77c+77dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx = \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{B\int\frac{35153041(bc-ad)(c+dx)^3\left(A+I\right.}{a+bx}}{154d}$$

$$= \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{(456533B(bc-ad))\int\frac{(c+dx)}{}}{2d}$$

$$= \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{(456533B(bc-ad))\int\left(\frac{d(bc-}{}\right.}{}$$

$$= \frac{456533(c+dx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4d} - \frac{(456533B(bc-ad))\int(c+a}{2}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} - \frac{456533B(bc-ad)^2(c+dx)^2\left(A+B\log\left(\frac{e(}{}\right.\right.}{4b^2d}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} - \frac{456533B^2(bc-ad)^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2b^4}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} - \frac{456533B^2(bc-ad)^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2b^4}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456533B^2(bc-a}{12b^2}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456533B^2(bc-a}{12b^2}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456533B^2(bc-a}{12b^2}$$

$$= -\frac{456533AB(bc-ad)^3x}{2b^3} + \frac{2282665B^2(bc-ad)^3x}{12b^3} + \frac{456533B^2(bc-a}{12b^2}$$

Mathematica [A] time = 0.303566, size = 389, normalized size = 0.93

$$i^3\left((c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2-\frac{B(bc-ad)\left(-3B(bc-ad)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+3b^2(c+dx)^2(bc-ad)\left(B\log\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i^3*((c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(
6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a + b*
x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^
2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)
] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*
b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3*Log[
a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c + d
*x] - 3*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(
b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(3*b^4)))/(4*d
)
```

Maple [F] time = 2.146, size = 0, normalized size = 0.

$$\int (dix+ci)^3\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.87103, size = 2415, normalized size = 5.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*d^3*i^3*x^4 + A^2*c*d^2*i^3*x^3 + 3/2*A^2*c^2*d*i^3*x^2 + 2*(x*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B
*c^3*i^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b
^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*c^2*d*i^3 + (2*x^3*log
(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x
+ c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A
*B*c*d^2*i^3 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log
(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*d^3*
i^3 + A^2*c^3*i^3*x - 1/12*(26*a*b^2*c^3*d*i^3 - 21*a^2*b*c^2*d^2*i^3 + 6*a
^3*c*d^3*i^3 + (6*i^3*log(e) - 11*i^3)*b^3*c^4)*B^2*log(d*x + c)/(b^3*d) -
1/2*(b^4*c^4*i^3 - 4*a*b^3*c^3*d*i^3 + 6*a^2*b^2*c^2*d^2*i^3 - 4*a^3*b*c*d^
```

```
3*i^3 + a^4*d^4*i^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dil
og(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d) + 1/12*(3*B^2*b^4*d^4*i^3*x^4*l
og(e)^2 + 2*(a*b^3*d^4*i^3*log(e) + (6*i^3*log(e)^2 - i^3*log(e))*b^4*c*d^3
)*B^2*x^3 + ((18*i^3*log(e)^2 - 9*i^3*log(e) + i^3)*b^4*c^2*d^2 + 2*(6*i^3*
log(e) - i^3)*a*b^3*c*d^3 - (3*i^3*log(e) - i^3)*a^2*b^2*d^4)*B^2*x^2 + ((1
2*i^3*log(e)^2 - 18*i^3*log(e) + 7*i^3)*b^4*c^3*d + (36*i^3*log(e) - 19*i^3
)*a*b^3*c^2*d^2 - (24*i^3*log(e) - 17*i^3)*a^2*b^2*c*d^3 + (6*i^3*log(e) -
5*i^3)*a^3*b*d^4)*B^2*x + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3
+ 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + (4*a*b^3*c^3*d*i^3 -
6*a^2*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B^2)*log(b*x + a)^
2 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^
3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log(d*x + c)^2 + (6*B^2*b^
4*d^4*i^3*x^4*log(e) + 2*(a*b^3*d^4*i^3 + (12*i^3*log(e) - i^3)*b^4*c*d^3)*
B^2*x^3 + 3*(4*a*b^3*c*d^3*i^3 - a^2*b^2*d^4*i^3 + 3*(4*i^3*log(e) - i^3)*b
^4*c^2*d^2)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*i^3 - 4*a^2*b^2*c*d^3*i^3 + a^3*b*
d^4*i^3 + (4*i^3*log(e) - 3*i^3)*b^4*c^3*d)*B^2*x + (6*(4*i^3*log(e) - 3*i^
3)*a*b^3*c^3*d - 9*(4*i^3*log(e) - 5*i^3)*a^2*b^2*c^2*d^2 + 2*(12*i^3*log(e
) - 19*i^3)*a^3*b*c*d^3 - (6*i^3*log(e) - 11*i^3)*a^4*d^4)*B^2)*log(b*x + a
) - (6*B^2*b^4*d^4*i^3*x^4*log(e) + 2*(a*b^3*d^4*i^3 + (12*i^3*log(e) - i^3
)*b^4*c*d^3)*B^2*x^3 + 3*(4*a*b^3*c*d^3*i^3 - a^2*b^2*d^4*i^3 + 3*(4*i^3*lo
g(e) - i^3)*b^4*c^2*d^2)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*i^3 - 4*a^2*b^2*c*d^3
*i^3 + a^3*b*d^4*i^3 + (4*i^3*log(e) - 3*i^3)*b^4*c^3*d)*B^2*x + 6*(B^2*b^4
*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*
b^4*c^3*d*i^3*x + (4*a*b^3*c^3*d*i^3 - 6*a^2*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^
3*i^3 - a^4*d^4*i^3)*B^2)*log(b*x + a))*log(d*x + c))/(b^4*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(\frac{bex +}{dx +}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c^
3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c^
3*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i^
3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)^3 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.78 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=712

$$\frac{2Bi^3(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g}+\frac{2B^2i^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g}-\frac{5B^2i^3(bc-ad)^3\text{Pol}}{3b^4}$$

```
[Out] (B^2*d*(b*c - a*d)^2*i^3*x)/(3*b^3*g) + (B^2*(b*c - a*d)^3*i^3*Log[(a + b*x
)/(c + d*x)])/(3*b^4*g) - (5*B*d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(3*b^4*g) - (B*(b*c - a*d)*i^3*(c + d*x)^2*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(3*b^2*g) + (2*B*(b*c - a*d)^3*i^3*Log[(b*c -
 a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g) + (d*(b*
c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*g) +
((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2
*g) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b*g) + (2
*B^2*(b*c - a*d)^3*i^3*Log[c + d*x])/(b^4*g) + (5*B*(b*c - a*d)^3*i^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*b^
4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - (b
*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*PolyLog[2, (
d*(a + b*x))/(b*(c + d*x))])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(3*b^4*g) + (2*B*(b*c - a*d)^3*i^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)
 + (2*B^2*(b*c - a*d)^3*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g
)
```

Rubi [B] time = 5.68693, antiderivative size = 1868, normalized size of antiderivative = 2.62, number of steps used = 106, number of rules used = 28, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31, 43}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x),
x]
```

```
[Out] (-5*A*B*d*(b*c - a*d)^2*i^3*x)/(3*b^3*g) + (B^2*d*(b*c - a*d)^2*i^3*x)/(3*b
^3*g) + (B^2*(b*c - a*d)^3*i^3*Log[a + b*x])/(3*b^4*g) - (a*B^2*d*(b*c - a*
d)^2*i^3*Log[a + b*x]^2)/(b^4*g) + (5*B^2*(b*c - a*d)^3*i^3*Log[a + b*x]^2)
/(6*b^4*g) - (A*B*(b*c - a*d)^3*i^3*Log[g*(a + b*x)]^2)/(b^4*g) + (B^2*(b*c
 - a*d)^3*i^3*Log[g*(a + b*x)]^3)/(3*b^4*g) - (B^2*(b*c - a*d)^3*i^3*Log[a
+ b*x]^2*Log[-c - d*x])/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*Log[a + b*x]*Log
[g*(a + b*x)]*Log[-c - d*x])/(b^4*g) - (B^2*(b*c - a*d)^3*i^3*Log[g*(a + b*
x)]^2*Log[-c - d*x])/(b^4*g) + (B^2*(b*c - a*d)^3*i^3*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(b^4*g) - (B^2*(b*c - a*d)^3*i^3*Log[g*
(a + b*x)]*Log[(c + d*x)^(-1)]^2)/(b^4*g) - (5*B^2*d*(b*c - a*d)^2*i^3*(a +
 b*x)*Log[(e*(a + b*x))/(c + d*x)])/(3*b^4*g) - (B*(b*c - a*d)*i^3*(c + d*x
)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2*g) + (2*a*B*d*(b*c - a*d)^
2*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g) - (5*B*(b*
c - a*d)^3*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^4*g)
 + (d*(b*c - a*d)^2*i^3*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g) +
 ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^
```

```
2*g) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b*g) + (
5*B^2*(b*c - a*d)^3*i^3*Log[c + d*x])/(3*b^4*g) + (2*B^2*c*(b*c - a*d)^2*i^
3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g) - (2*B*c*(b*c - a
*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b^3*g) - (B^2
*c*(b*c - a*d)^2*i^3*Log[c + d*x]^2)/(b^3*g) + (2*a*B^2*d*(b*c - a*d)^2*i^3
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) - (5*B^2*(b*c - a*d)^
3*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^4*g) + (B^2*(b*c -
a*d)^3*i^3*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) + (B^2*(b
*c - a*d)^3*i^3*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g)
+ ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[a*g + b*g*x
])/(b^4*g) + (2*A*B*(b*c - a*d)^3*i^3*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*
g + b*g*x])/(b^4*g) - (2*B^2*(b*c - a*d)^3*i^3*(Log[a + b*x] + Log[(c + d*x
)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[(b*(c + d*x))/(b*c - a*d)]*Log[
a*g + b*g*x])/(b^4*g) - (B^2*(b*c - a*d)^3*i^3*Log[(e*(a + b*x))/(c + d*x)]
*Log[a*g + b*g*x]^2)/(b^4*g) - (B^2*(b*c - a*d)^3*i^3*Log[(b*(c + d*x))/(b*
c - a*d)]*Log[a*g + b*g*x]^2)/(b^4*g) + (2*a*B^2*d*(b*c - a*d)^2*i^3*PolyLo
g[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) + (2*A*B*(b*c - a*d)^3*i^3*Poly
Log[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*Po
lyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^4*g) + (2*B^2*(b*c - a*d)^3*i^
3*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) - (2*B^2*(
b*c - a*d)^3*i^3*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c
 + d*x)])*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) + (2*B^2*c*(b*c
 - a*d)^2*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g) - (2*B^2*(b*c
- a*d)^3*i^3*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^
4*g) - (2*B^2*(b*c - a*d)^3*i^3*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(
b^4*g) - (2*B^2*(b*c - a*d)^3*i^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(b
^4*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
```

```
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
```

```
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(78c+78dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{474552d(bc-ad)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{6084d(bc-ad)(78c+78dx}{b^2g}\right.$$

$$= \frac{\left(474552(bc-ad)^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx}{b^3} + \frac{(78d)\int (78c+78dx)^2 \left(A+B\log\right.}{bg}$$

$$= \frac{474552d(bc-ad)^2 x \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-ad)(c+dx)^2 \left(A\right.}{b^2g}$$

$$= \frac{474552d(bc-ad)^2 x \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-ad)(c+dx)^2 \left(A\right.}{b^2g}$$

$$= \frac{474552d(bc-ad)^2 x \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-ad)(c+dx)^2 \left(A\right.}{b^2g}$$

$$= \frac{474552d(bc-ad)^2 x \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g} + \frac{237276(bc-ad)(c+dx)^2 \left(A\right.}{b^2g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} - \frac{158184B(bc-ad)(c+dx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{b^2g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} - \frac{790920B^2d(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g} - 15$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} - \frac{790920B^2d(bc-ad)^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g} - 15$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

$$= -\frac{790920ABd(bc-ad)^2 x}{b^3g} + \frac{158184B^2d(bc-ad)^2 x}{b^3g} + \frac{158184B^2(bc-ad)^3 \mathrm{lo}}{b^4g}$$

Mathematica [B] time = 3.92239, size = 3984, normalized size = 5.6

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x),x]
```

```
[Out] (i^3*(108*A*b^3*B*c^3 - 216*a*A*b^2*B*c^2*d - 12*a*b^2*B^2*c^2*d + 144*a^2*
A*b*B*c*d^2 - 18*a^2*b*B^2*c*d^2 - 36*a^3*A*B*d^3 - 36*a^3*B^2*d^3 + 54*A^2
*b^3*c^2*d*x - 42*A*b^3*B*c^2*d*x + 6*b^3*B^2*c^2*d*x - 54*a*A^2*b^2*c*d^2*
x + 72*a*A*b^2*B*c*d^2*x - 12*a*b^2*B^2*c*d^2*x + 18*a^2*A^2*b*d^3*x - 30*a
^2*A*b*B*d^3*x + 6*a^2*b*B^2*d^3*x + 27*A^2*b^3*c*d^2*x^2 - 6*A*b^3*B*c*d^2
*x^2 - 9*a*A^2*b^2*d^3*x^2 + 6*a*A*b^2*B*d^3*x^2 + 6*A^2*b^3*d^3*x^3 + 108*
a*A*b^2*B*c^2*d*Log[a/b + x] + 12*a*b^2*B^2*c^2*d*Log[a/b + x] - 108*a^2*A*
b*B*c*d^2*Log[a/b + x] - 18*a^2*b*B^2*c*d^2*Log[a/b + x] + 36*a^3*A*B*d^3*L
og[a/b + x] - 13*a^3*B^2*d^3*Log[a/b + x] + 18*A*b^3*B*c^3*Log[a/b + x]^2 -
 54*a*A*b^2*B*c^2*d*Log[a/b + x]^2 + 54*a^2*A*b*B*c*d^2*Log[a/b + x]^2 - 18
*a^3*A*B*d^3*Log[a/b + x]^2 - 3*a^3*B^2*d^3*Log[a/b + x]^2 + 12*a^3*B^2*d^3
*Log[a/b + x]^3 - 108*A*b^3*B*c^3*Log[c/d + x] - 22*b^3*B^2*c^3*Log[c/d + x
] + 108*a*A*b^2*B*c^2*d*Log[c/d + x] - 27*a*b^2*B^2*c^2*d*Log[c/d + x] - 36
*a^2*A*b*B*c*d^2*Log[c/d + x] - 36*a^3*B^2*d^3*Log[c/d + x] + 36*a^2*b*B^2*
c*d^2*Log[a/b + x]*Log[c/d + x] - 30*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x]
 + 6*b^3*B^2*c^3*Log[c/d + x]^2 + 9*a*b^2*B^2*c^2*d*Log[c/d + x]^2 - 18*a^2*
b*B^2*c*d^2*Log[c/d + x]^2 + 18*A^2*b^3*c^3*Log[a + b*x] - 54*a*A^2*b^2*c^2
*d*Log[a + b*x] + 54*a^2*A^2*b*c*d^2*Log[a + b*x] - 54*a^2*A*b*B*c*d^2*Log[
a + b*x] + 6*a^2*b*B^2*c*d^2*Log[a + b*x] - 18*a^3*A^2*d^3*Log[a + b*x] + 3
0*a^3*A*B*d^3*Log[a + b*x] + 13*a^3*B^2*d^3*Log[a + b*x] - 36*A*b^3*B*c^3*L
og[a/b + x]*Log[a + b*x] + 108*a*A*b^2*B*c^2*d*Log[a/b + x]*Log[a + b*x] -
108*a^2*A*b*B*c*d^2*Log[a/b + x]*Log[a + b*x] + 36*a^3*A*B*d^3*Log[a/b + x]
*Log[a + b*x] - 30*a^3*B^2*d^3*Log[a/b + x]*Log[a + b*x] - 18*a^3*B^2*d^3*L
og[a/b + x]^2*Log[a + b*x] + 36*A*b^3*B*c^3*Log[c/d + x]*Log[a + b*x] - 108
*a*A*b^2*B*c^2*d*Log[c/d + x]*Log[a + b*x] + 108*a^2*A*b*B*c*d^2*Log[c/d +
x]*Log[a + b*x] - 36*a^3*A*B*d^3*Log[c/d + x]*Log[a + b*x] + 30*a^3*B^2*d^3
*Log[c/d + x]*Log[a + b*x] + 36*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x]*Log[a
 + b*x] - 18*a^3*B^2*d^3*Log[c/d + x]^2*Log[a + b*x] - 36*A*b^3*B*c^3*Log[c
/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 108*a*A*b^2*B*c^2*d*Log[c/d + x
]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 108*a^2*A*b*B*c*d^2*Log[c/d + x]*Log[
(d*(a + b*x))/(-(b*c) + a*d)] + 36*a^3*A*B*d^3*Log[c/d + x]*Log[(d*(a + b*x
))/(-(b*c) + a*d)] - 36*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x]*Log[(d*(a + b
*x))/(-(b*c) + a*d)] + 18*a^3*B^2*d^3*Log[c/d + x]^2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] - 54*b^3*B^2*c^3*Log[((b*c - a*d)*e)/(c + d*x)] + 108*a*b^2*B^2
*c^2*d*Log[((b*c - a*d)*e)/(c + d*x)] - 54*a^2*b*B^2*c*d^2*Log[((b*c - a*d)
*e)/(c + d*x)] - 54*a*b^2*B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)] + 90*a^2*b
*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)] - 36*a^3*B^2*d^3*Log[(e*(a + b*x))/
(c + d*x)] + 108*A*b^3*B*c^2*d*x*Log[(e*(a + b*x))/(c + d*x)] - 42*b^3*B^2*
c^2*d*x*Log[(e*(a + b*x))/(c + d*x)] - 108*a*A*b^2*B*c*d^2*x*Log[(e*(a + b*
x))/(c + d*x)] + 72*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x))/(c + d*x)] + 36*a^2
*A*b*B*d^3*x*Log[(e*(a + b*x))/(c + d*x)] - 30*a^2*b*B^2*d^3*x*Log[(e*(a +
b*x))/(c + d*x)] + 54*A*b^3*B*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] - 6*b^
3*B^2*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] - 18*a*A*b^2*B*d^3*x^2*Log[(e*
(a + b*x))/(c + d*x)] + 6*a*b^2*B^2*d^3*x^2*Log[(e*(a + b*x))/(c + d*x)] +
12*A*b^3*B*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)] + 36*a^3*B^2*d^3*Log[a/b +
x]*Log[(e*(a + b*x))/(c + d*x)] - 18*a^3*B^2*d^3*Log[a/b + x]^2*Log[(e*(a +
 b*x))/(c + d*x)] - 36*a^2*b*B^2*c*d^2*Log[c/d + x]*Log[(e*(a + b*x))/(c +
d*x)] + 36*A*b^3*B*c^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 108*a*A*
b^2*B*c^2*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 108*a^2*A*b*B*c*d^2
*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 36*a^3*A*B*d^3*Log[a + b*x]*Lo
```

```
g[(e*(a + b*x))/(c + d*x)] + 30*a^3*B^2*d^3*Log[a + b*x]*Log[(e*(a + b*x))/
(c + d*x)] + 36*a^3*B^2*d^3*Log[a/b + x]*Log[a + b*x]*Log[(e*(a + b*x))/(c
+ d*x)] - 36*a^3*B^2*d^3*Log[c/d + x]*Log[a + b*x]*Log[(e*(a + b*x))/(c + d
*x)] + 36*a^3*B^2*d^3*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[(e
*(a + b*x))/(c + d*x)] + 54*a*b^2*B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)]^2
- 81*a^2*b*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 54*b^3*B^2*c^2*d*x*Lo
g[(e*(a + b*x))/(c + d*x)]^2 - 54*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x))/(c +
d*x)]^2 + 18*a^2*b*B^2*d^3*x*Log[(e*(a + b*x))/(c + d*x)]^2 + 27*b^3*B^2*c*
d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 - 9*a*b^2*B^2*d^3*x^2*Log[(e*(a + b*
x))/(c + d*x)]^2 + 6*b^3*B^2*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)]^2 - 18*b^
3*B^2*c^3*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2
- 18*a^3*B^2*d^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2 - 18*a*b^2*B^2
*c^2*d*Log[(e*(a + b*x))/(c + d*x)]^3 + 18*a^2*b*B^2*c*d^2*Log[(e*(a + b*x)
)/(c + d*x)]^3 + 42*A*b^3*B*c^3*Log[c + d*x] + 4*b^3*B^2*c^3*Log[c + d*x] -
 18*a*A*b^2*B*c^2*d*Log[c + d*x] + 15*a*b^2*B^2*c^2*d*Log[c + d*x] + 66*a^2
*b*B^2*c*d^2*Log[c + d*x] + 12*b^3*B^2*c^3*Log[a/b + x]*Log[c + d*x] + 18*a
*b^2*B^2*c^2*d*Log[a/b + x]*Log[c + d*x] - 12*b^3*B^2*c^3*Log[c/d + x]*Log[
c + d*x] - 18*a*b^2*B^2*c^2*d*Log[c/d + x]*Log[c + d*x] - 12*b^3*B^2*c^3*Lo
g[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 18*a*b^2*B^2*c^2*d*Log[(e*(a + b*
x))/(c + d*x)]*Log[c + d*x] - 12*b^3*B^2*c^3*Log[a/b + x]*Log[(b*(c + d*x))
/(b*c - a*d)] - 18*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*
d)] - 36*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + 66*a
^3*B^2*d^3*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] - 18*a^3*B^2*d^3*Log
[a/b + x]^2*Log[(b*(c + d*x))/(b*c - a*d)] + 54*b^3*B^2*c^3*Log[(e*(a + b*x
))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 216*a*b^2*B^2*c^2*d*Log[(e*(
a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 162*a^2*b*B^2*c*d^2*L
og[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 54*a*b^2*B^2*c
^2*d*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 54*a^2
*b*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)]
- 6*B^2*(2*b^3*c^3 + 3*a*b^2*c^2*d + 6*a^2*b*c*d^2 - 11*a^3*d^3 + 6*a^3*d^3
*Log[a/b + x])*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 54*b*B^2*c*(b*c -
 a*d)*(b*c - 3*a*d + 2*a*d*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a +
 b*x))/(b*(c + d*x))] - 36*A*b^3*B*c^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
] + 108*a*A*b^2*B*c^2*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 108*a^2*A*b
*B*c*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 36*a^3*A*B*d^3*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)] - 36*a^3*B^2*d^3*Log[a/b + x]*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)] + 36*a^3*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)] + 36*b^3*B^2*c^3*Log[(e*(a + b*x))/(c + d*x)]*
PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 36*a^3*B^2*d^3*PolyLog[3, (d*(a +
 b*x))/(-(b*c) + a*d)] - 108*a*b^2*B^2*c^2*d*PolyLog[3, (d*(a + b*x))/(b*(c
 + d*x))] + 108*a^2*b*B^2*c*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 3
6*a^3*B^2*d^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 36*b^3*B^2*c^3*PolyLo
g[3, (b*(c + d*x))/(d*(a + b*x))]))/(18*b^4*g)
```

Maple [F] time = 3.243, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{bgx+ag}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="maxima")
```

```
[Out] 3*A^2*c^2*d*i^3*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/6*A^2*d^3*i^3*(6*a^3
*log(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) + 3/2*A^
2*c*d^2*i^3*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A^2*c^
3*i^3*log(b*g*x + a*g)/(b*g) + 1/6*(2*B^2*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^2*
i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2
*b*d^3*i^3)*B^2*x + 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3
- a^3*d^3*i^3)*B^2*log(b*x + a))*log(d*x + c)^2/(b^4*g) - integrate(-1/3*(3
*B^2*b^4*c^4*i^3*log(e)^2 + 6*A*B*b^4*c^4*i^3*log(e) + 3*(B^2*b^4*d^4*i^3*l
og(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))*x^4 + 12*(B^2*b^4*c*d^3*i^3*log(e)^2 +
2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 18*(B^2*b^4*c^2*d^2*i^3*log(e)^2 + 2*A*B*
b^4*c^2*d^2*i^3*log(e))*x^2 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*
x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*
log(b*x + a)^2 + 12*(B^2*b^4*c^3*d*i^3*log(e)^2 + 2*A*B*b^4*c^3*d*i^3*log(e
))*x + 6*(B^2*b^4*c^4*i^3*log(e) + A*B*b^4*c^4*i^3 + (B^2*b^4*d^4*i^3*log(e
) + A*B*b^4*d^4*i^3)*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*d^3*i^3)
*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d^2*i^3)*x^2 + 4*(B^2*b^
4*c^3*d*i^3*log(e) + A*B*b^4*c^3*d*i^3)*x)*log(b*x + a) - (6*B^2*b^4*c^4*i^
3*log(e) + 6*A*B*b^4*c^4*i^3 + 2*(3*A*B*b^4*d^4*i^3 + (3*i^3*log(e) + i^3)*
B^2*b^4*d^4)*x^4 + (24*A*B*b^4*c*d^3*i^3 - (a*b^3*d^4*i^3 - 3*(8*i^3*log(e)
 + 3*i^3)*b^4*c*d^3)*B^2)*x^3 + 3*(12*A*B*b^4*c^2*d^2*i^3 - (3*a*b^3*c*d^3*
i^3 - a^2*b^2*d^4*i^3 - 6*(2*i^3*log(e) + i^3)*b^4*c^2*d^2)*B^2)*x^2 + 6*(4
*A*B*b^4*c^3*d*i^3 + (4*b^4*c^3*d*i^3*log(e) + 3*a*b^3*c^2*d^2*i^3 - 3*a^2*
b^2*c*d^3*i^3 + a^3*b*d^4*i^3)*B^2)*x + 6*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*
c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + (5*b^4*c^3*d*i^3 - 3*a*b^3*c^2*
d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B^2*x + (b^4*c^4*i^3 + a*b^3
*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B^2)*
log(b*x + a))*log(d*x + c))/(b^5*d*g*x^2 + a*b^4*c*g + (b^5*c*g + a*b^4*d*g
)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(\frac{bex+ae}{dx+c}\right.}{bgx + ag}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i
^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b*
g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
), x)
```

3.79 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=692

$$\frac{6Bdi^3(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^2}+\frac{4B^2di^3(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^2}-\frac{B^2di^3(bc-ad)^2\text{I}}{}$$

```
[Out] (-2*B^2*(b*c - a*d)^2*i^3*(c + d*x))/(b^3*g^2*(a + b*x)) - (B*d^2*(b*c - a*
d)*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) - (2*B*(b*
c - a*d)^2*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2*(a
+ b*x)) + (4*B*d*(b*c - a*d)^2*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c +
d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^2*(a + b*x)) + (d*i^3*(
c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2*g^2) + (B^2*d*(b*
c - a*d)^2*i^3*Log[c + d*x])/(b^4*g^2) + (B*d*(b*c - a*d)^2*i^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) -
 (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - (b*(
c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (4*B^2*d*(b*c - a*d)^2*i^3*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^2) - (B^2*d*(b*c - a*d)^2*i^3*PolyLog
[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B*d*(b*c - a*d)^2*i^3*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)
)])/(b^4*g^2)
```

Rubi [B] time = 4.81588, antiderivative size = 1751, normalized size of antiderivative = 2.53, number of steps used = 90, number of rules used = 23, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.548, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
2,x]
```

```
[Out] -((A*B*d^2*(b*c - a*d)*i^3*x)/(b^3*g^2)) - (2*B^2*(b*c - a*d)^3*i^3)/(b^4*g
^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)^2*i^3*Log[a + b*x])/(b^4*g^2) + (a^2*B
^2*d^3*i^3*Log[a + b*x]^2)/(2*b^4*g^2) - (a*B^2*d^2*(3*b*c - 2*a*d)*i^3*Log
[a + b*x]^2)/(b^4*g^2) - (3*A*B*d*(b*c - a*d)^2*i^3*Log[a + b*x]^2)/(b^4*g^
2) + (B^2*d*(b*c - a*d)^2*i^3*Log[a + b*x]^2)/(b^4*g^2) - (B^2*d^2*(b*c - a
*d)*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^4*g^2) - (3*B^2*d*(b*c -
 a*d)^2*i^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^
2)/(b^4*g^2) - (3*B^2*d*(b*c - a*d)^2*i^3*Log[a + b*x]*Log[(e*(a + b*x))/(c
 + d*x)]^2)/(b^4*g^2) - (2*B*(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(b^4*g^2*(a + b*x)) - (a^2*B*d^3*i^3*Log[a + b*x]*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(b^4*g^2) + (2*a*B*d^2*(3*b*c - 2*a*d)*i^3*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) - (2*B*d*(b*c - a*d)^2*
i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) + (d^2*(3*
b*c - 2*a*d)*i^3*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^2) + (d^3
*i^3*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2*g^2) - ((b*c - a*d)
^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*g^2*(a + b*x)) + (3*d*(
b*c - a*d)^2*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*
```

```
g^2) + (3*B^2*d*(b*c - a*d)^2*i^3*Log[c + d*x])/(b^4*g^2) - (B^2*c^2*d*i^3*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*g^2) + (2*B^2*c*d*(3*b
*c - 2*a*d)*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^2) -
 (2*B^2*d*(b*c - a*d)^2*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])
/(b^4*g^2) + (B*c^2*d*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x]
)/(b^2*g^2) - (2*B*c*d*(3*b*c - 2*a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)])*Log[c + d*x])/(b^3*g^2) + (2*B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*Log[c + d*x])/(b^4*g^2) + (B^2*c^2*d*i^3*Log[c + d*x]^2)/
(2*b^2*g^2) - (B^2*c*d*(3*b*c - 2*a*d)*i^3*Log[c + d*x]^2)/(b^3*g^2) + (B^2
*d*(b*c - a*d)^2*i^3*Log[c + d*x]^2)/(b^4*g^2) - (a^2*B^2*d^3*i^3*Log[a + b
*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^2) + (2*a*B^2*d^2*(3*b*c - 2*a*d
)*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^2) + (6*A*B*d*(b*
c - a*d)^2*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^2) - (2*
B^2*d*(b*c - a*d)^2*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g
^2) - (a^2*B^2*d^3*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^2)
+ (2*a*B^2*d^2*(3*b*c - 2*a*d)*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]
)/(b^4*g^2) + (6*A*B*d*(b*c - a*d)^2*i^3*PolyLog[2, -((d*(a + b*x))/(b*c -
a*d))])/(b^4*g^2) - (2*B^2*d*(b*c - a*d)^2*i^3*PolyLog[2, -((d*(a + b*x))/(
b*c - a*d))])/(b^4*g^2) - (B^2*c^2*d*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])/(b^2*g^2) + (2*B^2*c*d*(3*b*c - 2*a*d)*i^3*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)^2*i^3*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/(b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*Log[(e*(a + b*x))/(c
+ d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^2) + (6*B^2*d*(b*
c - a*d)^2*i^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
```

```
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(79c+79dx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{493039d^2(3bc-2ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x\left(A+B\log\right.}{b^2g^2}\right.$$

$$= \frac{\left(493039d^3\right)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{b^2g^2} + \frac{\left(493039d^2(3bc-2ad)\right)\int \left(\right.}{b^3g^2}$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2\left(A+B\log\right.}{2b^2g^2}$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2\left(A+B\log\right.}{2b^2g^2}$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2\left(A+B\log\right.}{2b^2g^2}$$

$$= \frac{493039d^2(3bc-2ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^2} + \frac{493039d^3x^2\left(A+B\log\right.}{2b^2g^2}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^2(a+bx)} -$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{493039B^2d^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2} -$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{493039B^2d^2(bc-ad)(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2} -$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B^2d(bc-ad)^2}{b^4g^2}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B^2d(bc-ad)^2}{b^4g^2}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B^2d(bc-ad)^2}{b^4g^2}$$

$$= -\frac{493039ABd^2(bc-ad)x}{b^3g^2} - \frac{986078B^2(bc-ad)^3}{b^4g^2(a+bx)} - \frac{986078B^2d(bc-ad)^2}{b^4g^2}$$

Mathematica [B] time = 17.1514, size = 5108, normalized size = 7.38

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^2,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 3.813, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{(bgx+ag)^2}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="maxima")
```

```
[Out] -3*A^2*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g
^2))*c*d^2*i^3 + 1/2*(2*a^3/(b^5*g^2*x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b
^4*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2))*A^2*d^3*i^3 + 3*A^2*c^2*d*i^3*(a/(b^3*
g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - 2*A*B*c^3*i^3*(log(b*e*x/(d*
x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x + a*b*g^2) + d
*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2))
 - A^2*c^3*i^3/(b^2*g^2*x + a*b*g^2) + 1/2*(B^2*b^3*d^3*i^3*x^3 + 3*(2*b^3*
c*d^2*i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^3 - 2*a^2*b*d^3*i^3
)*B^2*x - 2*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*
i^3)*B^2 + 6*((b^3*c^2*d*i^3 - 2*a*b^2*c*d^2*i^3 + a^2*b*d^3*i^3)*B^2*x + (
a*b^2*c^2*d*i^3 - 2*a^2*b*c*d^2*i^3 + a^3*d^3*i^3)*B^2)*log(b*x + a))*log(d
*x + c)^2/(b^5*g^2*x + a*b^4*g^2) - integrate(-(B^2*b^4*c^4*i^3*log(e)^2 +
(B^2*b^4*d^4*i^3*log(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))*x^4 + 4*(B^2*b^4*c*d^
3*i^3*log(e)^2 + 2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*l
og(e)^2 + 2*A*B*b^4*c^2*d^2*i^3*log(e))*x^2 + (B^2*b^4*d^4*i^3*x^4 + 4*B^2*
b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2
*b^4*c^4*i^3)*log(b*x + a)^2 + 2*(2*B^2*b^4*c^3*d*i^3*log(e)^2 + 3*A*B*b^4*
c^3*d*i^3*log(e))*x + 2*(B^2*b^4*c^4*i^3*log(e) + (B^2*b^4*d^4*i^3*log(e) +
 A*B*b^4*d^4*i^3)*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*d^3*i^3)*x^
3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d^2*i^3)*x^2 + (4*B^2*b^4*c
^3*d*i^3*log(e) + 3*A*B*b^4*c^3*d*i^3)*x)*log(b*x + a) - ((2*A*B*b^4*d^4*i^
3 + (2*i^3*log(e) + i^3)*B^2*b^4*d^4)*x^4 + 2*(4*A*B*b^4*c*d^3*i^3 - (a*b^3
```

```
*d^4*i^3 - (4*i^3*log(e) + 3*i^3)*b^4*c*d^3)*B^2)*x^3 + 2*(b^4*c^4*i^3*log(
e) - a*b^3*c^3*d*i^3 + 3*a^2*b^2*c^2*d^2*i^3 - 3*a^3*b*c*d^3*i^3 + a^4*d^4*
i^3)*B^2 + (12*A*B*b^4*c^2*d^2*i^3 + (12*b^4*c^2*d^2*i^3*log(e) + 12*a*b^3*
c*d^3*i^3 - 7*a^2*b^2*d^4*i^3)*B^2)*x^2 + 2*(3*A*B*b^4*c^3*d*i^3 + (3*a*b^3
*c^2*d^2*i^3 - a^3*b*d^4*i^3 + (4*i^3*log(e) - i^3)*b^4*c^3*d)*B^2)*x + 2*(
B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 3*(3*b^4*c^2*d^2*i^3 - 2*a*
b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B^2*x^2 + 2*(2*b^4*c^3*d*i^3 + 3*a*b^3*c^2
*d^2*i^3 - 6*a^2*b^2*c*d^3*i^3 + 3*a^3*b*d^4*i^3)*B^2*x + (b^4*c^4*i^3 + 3*
a^2*b^2*c^2*d^2*i^3 - 6*a^3*b*c*d^3*i^3 + 3*a^4*d^4*i^3)*B^2)*log(b*x + a))
*log(d*x + c))/(b^6*d*g^2*x^3 + a^2*b^4*c*g^2 + (b^6*c*g^2 + 2*a*b^5*d*g^2)
*x^2 + (2*a*b^5*c*g^2 + a^2*b^4*d*g^2)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(\frac{bex+ae}{dx+c}\right.}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i
^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b^
2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{\left(bgx + ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^2, x)
```

3.80 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=604

$$\frac{6Bd^2i^3(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^4g^3}+\frac{2B^2d^2i^3(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^3}+\frac{6B^2d^2i^3(bc-ad)\text{Po}}{b^4g}$$

```
[Out] (-4*B^2*d*(b*c - a*d)*i^3*(c + d*x))/(b^3*g^3*(a + b*x)) - (B^2*(b*c - a*d)
*i^3*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) - (4*B*d*(b*c - a*d)*i^3*(c + d*x
)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d
)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^3*(a + b*x
)^2) + (2*B*d^2*(b*c - a*d)*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(b^4*g^3) + (d^3*i^3*(a + b*x)*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log
[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d
*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2*g^3*(a + b*x)^2) - (3*
d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - (b*(c +
d*x))/(d*(a + b*x))])/(b^4*g^3) + (2*B^2*d^2*(b*c - a*d)*i^3*PolyLog[2, (d*
(a + b*x))/(b*(c + d*x))])/(b^4*g^3) + (6*B*d^2*(b*c - a*d)*i^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3
) + (6*B^2*d^2*(b*c - a*d)*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^
4*g^3)
```

Rubi [B] time = 4.9264, antiderivative size = 1412, normalized size of antiderivative = 2.34, number of steps used = 95, number of rules used = 21, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$-\frac{aB^2d^3\log^2(a+bx)i^3}{b^4g^3}+\frac{5B^2d^2(bc-ad)\log^2(a+bx)i^3}{2b^4g^3}-\frac{3ABd^2(bc-ad)\log^2(a+bx)i^3}{b^4g^3}-\frac{3B^2d^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)}{b^4g^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
3,x]
```

```
[Out] -(B^2*(b*c - a*d)^3*i^3)/(4*b^4*g^3*(a + b*x)^2) - (9*B^2*d*(b*c - a*d)^2*i
^3)/(2*b^4*g^3*(a + b*x)) - (9*B^2*d^2*(b*c - a*d)*i^3*Log[a + b*x])/(2*b^4
*g^3) - (a*B^2*d^3*i^3*Log[a + b*x]^2)/(b^4*g^3) - (3*A*B*d^2*(b*c - a*d)*i
^3*Log[a + b*x]^2)/(b^4*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3*Log[a + b*x]^2)/(
2*b^4*g^3) - (3*B^2*d^2*(b*c - a*d)*i^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*L
og[(e*(a + b*x))/(c + d*x)]^2)/(b^4*g^3) - (3*B^2*d^2*(b*c - a*d)*i^3*Log[a
 + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^4*g^3) - (B*(b*c - a*d)^3*i^3*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^4*g^3*(a + b*x)^2) - (5*B*d*(b*c -
 a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3*(a + b*x)) + (2*
a*B*d^3*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3) -
(5*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(b^4*g^3) + (d^3*i^3*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^3*g^3) -
 ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^4*g^3*(a +
 b*x)^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
b^4*g^3*(a + b*x)) + (3*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(b^4*g^3) + (9*B^2*d^2*(b*c - a*d)*i^3*Log[c + d*x])/
(2*b^4*g^3) + (2*B^2*c*d^2*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
```

```
x])/(b^3*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*Log[-((d*(a + b*x))/(b*c - a*d))
]*Log[c + d*x])/(b^4*g^3) - (2*B*c*d^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)])*Log[c + d*x])/(b^3*g^3) + (5*B*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*Log[c + d*x])/(b^4*g^3) - (B^2*c*d^2*i^3*Log[c + d*x]^2)/
(b^3*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3*Log[c + d*x]^2)/(2*b^4*g^3) + (2*a*B
^2*d^3*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^3) + (6*A*B*
d^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^3)
- (5*B^2*d^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
b^4*g^3) + (2*a*B^2*d^3*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*
g^3) + (6*A*B*d^2*(b*c - a*d)*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])
/(b^4*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a
*d))])/(b^4*g^3) + (2*B^2*c*d^2*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/
(b^3*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*Log[(e*(a + b*x))/(c + d*x)]*Poly
Log[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i
^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(80c+80dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = \int\left(\frac{512000d^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}+\frac{512000(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b^3g^3(a+bx)^3}\right.$$

$$=\frac{\left(512000d^3\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx}{b^3g^3}+\frac{\left(1536000d^2(bc-ad)\right)\int\frac{\left(A+B\log\right.}{a+}}{b^3g^3}$$

$$=\frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}$$

$$=\frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}$$

$$=\frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}$$

$$=\frac{512000d^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^3}-\frac{256000(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}$$

$$=-\frac{256000B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}-\frac{2560000Bd(bc-ad)^2\left(A+B\,\mathrm{l}\right.}{b^4g^3(a+bx)}$$

$$=-\frac{256000B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)^2}-\frac{2560000Bd(bc-ad)^2\left(A+B\,\mathrm{l}\right.}{b^4g^3(a+bx)}$$

$$=-\frac{1536000B^2d^2(bc-ad)\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^3}-\frac{256000B(bc-ad)^3\left(A\right.}{b^4g^3(a+}$$

$$=-\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000B^2d^2(bc-ad)\,\mathrm{lo}}{b^4g^3}$$

$$=-\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000B^2d^2(bc-ad)\,\mathrm{lo}}{b^4g^3}$$

$$=-\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000B^2d^2(bc-ad)\,\mathrm{lo}}{b^4g^3}$$

$$=-\frac{128000B^2(bc-ad)^3}{b^4g^3(a+bx)^2}-\frac{2304000B^2d(bc-ad)^2}{b^4g^3(a+bx)}-\frac{2304000B^2d^2(bc-ad)\,\mathrm{lo}}{b^4g^3}$$

Mathematica [B] time = 14.995, size = 6284, normalized size = 10.4

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 3.958, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{(bgx+ag)^3}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="maxima")
```

```
[Out] -3/2*A*B*c^2*d*i^3*(2*(2*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4
*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a
*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*
b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*
b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 -
2*a*b^3*c*d + a^2*b^2*d^2)*g^3)) - 1/2*A^2*d^3*i^3*((6*a^2*b*x + 5*a^3)/(b^
6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log(b*x + a)
/(b^4*g^3)) + 3/2*A^2*c*d^2*i^3*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g
^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 1/2*A*B*c^3*i^3*((2*b*d*x
 - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x
+ (a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*
g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b
^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2
*b*d^2)*g^3)) - 3/2*(2*b*x + a)*A^2*c^2*d*i^3/(b^4*g^3*x^2 + 2*a*b^3*g^3*x
+ a^2*b^2*g^3) - 1/2*A^2*c^3*i^3/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
+ 1/2*(2*B^2*b^3*d^3*i^3*x^3 + 4*B^2*a*b^2*d^3*i^3*x^2 - 2*(3*b^3*c^2*d*i^3
 - 6*a*b^2*c*d^2*i^3 + 2*a^2*b*d^3*i^3)*B^2*x - (b^3*c^3*i^3 + 3*a*b^2*c^2*
d*i^3 - 9*a^2*b*c*d^2*i^3 + 5*a^3*d^3*i^3)*B^2 + 6*((b^3*c*d^2*i^3 - a*b^2*
d^3*i^3)*B^2*x^2 + 2*(a*b^2*c*d^2*i^3 - a^2*b*d^3*i^3)*B^2*x + (a^2*b*c*d^2
*i^3 - a^3*d^3*i^3)*B^2)*log(b*x + a))*log(d*x + c)^2/(b^6*g^3*x^2 + 2*a*b^
5*g^3*x + a^2*b^4*g^3) - integrate(-(4*B^2*b^4*c^3*d*i^3*x*log(e)^2 + B^2*b
^4*c^4*i^3*log(e)^2 + (B^2*b^4*d^4*i^3*log(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))
*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e)^2 + 2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 6*
(B^2*b^4*c^2*d^2*i^3*log(e)^2 + A*B*b^4*c^2*d^2*i^3*log(e))*x^2 + (B^2*b^4*
d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b
^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log(b*x + a)^2 + 2*(4*B^2*b^4*c^3*d*i^3*x
*log(e) + B^2*b^4*c^4*i^3*log(e) + (B^2*b^4*d^4*i^3*log(e) + A*B*b^4*d^4*i^
3)*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*d^3*i^3)*x^3 + 3*(2*B^2*b^
4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d^2*i^3)*x^2)*log(b*x + a) - (2*(A*B*b^4
*d^4*i^3 + (i^3*log(e) + i^3)*B^2*b^4*d^4)*x^4 - (9*a*b^3*c^2*d^2*i^3 - 21*
a^2*b^2*c*d^3*i^3 + 9*a^3*b*d^4*i^3 - (8*i^3*log(e) - i^3)*b^4*c^3*d)*B^2*x
 + 2*(4*A*B*b^4*c*d^3*i^3 + (4*b^4*c*d^3*i^3*log(e) + 3*a*b^3*d^4*i^3)*B^2)
```

```
*x^3 + (2*b^4*c^4*i^3*log(e) - a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 9*
a^3*b*c*d^3*i^3 - 5*a^4*d^4*i^3)*B^2 + 6*(A*B*b^4*c^2*d^2*i^3 + (2*a*b^3*c*
d^3*i^3 + (2*i^3*log(e) - i^3)*b^4*c^2*d^2)*B^2)*x^2 + 2*(B^2*b^4*d^4*i^3*x
^4 + (7*b^4*c*d^3*i^3 - 3*a*b^3*d^4*i^3)*B^2*x^3 + 3*(2*b^4*c^2*d^2*i^3 + 3
*a*b^3*c*d^3*i^3 - 3*a^2*b^2*d^4*i^3)*B^2*x^2 + (4*b^4*c^3*d*i^3 + 9*a^2*b^
2*c*d^3*i^3 - 9*a^3*b*d^4*i^3)*B^2*x + (b^4*c^4*i^3 + 3*a^3*b*c*d^3*i^3 - 3
*a^4*d^4*i^3)*B^2)*log(b*x + a))*log(d*x + c))/(b^7*d*g^3*x^4 + a^3*b^4*c*g
^3 + (b^7*c*g^3 + 3*a*b^6*d*g^3)*x^3 + 3*(a*b^6*c*g^3 + a^2*b^5*d*g^3)*x^2
+ (3*a^2*b^5*c*g^3 + a^3*b^4*d*g^3)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(\frac{bex+ae}{dx+c}\right)^2}{b^3g^3x^3 + 3\,ab^2g^3x^2 + 3\,a^2bg^3x + a^3g^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i
^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b^
3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{\left(bgx + ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^3, x)
```

3.81 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=147

$$-\frac{i^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)}-\frac{Bi^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)}-\frac{B^2i^3(c+dx)^4}{32g^5(a+bx)^4(bc-ad)}$$

```
[Out] -(B^2*i^3*(c + d*x)^4)/(32*(b*c - a*d)*g^5*(a + b*x)^4) - (B*i^3*(c + d*x)^
4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)*g^5*(a + b*x)^4) - (
i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*(b*c - a*d)*g^5*
(a + b*x)^4)
```

Rubi [C] time = 4.5405, antiderivative size = 970, normalized size of antiderivative = 6.6, number of steps used = 130, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.262, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^3\log^2(a+bx)d^4}{4b^4(bc-ad)g^5}+\frac{B^2i^3\log^2(c+dx)d^4}{4b^4(bc-ad)g^5}-\frac{B^2i^3\log(a+bx)d^4}{8b^4(bc-ad)g^5}-\frac{Bi^3\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^4}{2b^4(bc-ad)g^5}+\frac{B^2i^3\log(\cdots}{8b^4(bc\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
5,x]
```

```
[Out] -(B^2*(b*c - a*d)^3*i^3)/(32*b^4*g^5*(a + b*x)^4) - (B^2*d*(b*c - a*d)^2*i^
3)/(8*b^4*g^5*(a + b*x)^3) - (3*B^2*d^2*(b*c - a*d)*i^3)/(16*b^4*g^5*(a + b
*x)^2) - (B^2*d^3*i^3)/(8*b^4*g^5*(a + b*x)) - (B^2*d^4*i^3*Log[a + b*x])/(
8*b^4*(b*c - a*d)*g^5) + (B^2*d^4*i^3*Log[a + b*x]^2)/(4*b^4*(b*c - a*d)*g^
5) - (B*(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*b^4*g^5*
(a + b*x)^4) - (B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(2*b^4*g^5*(a + b*x)^3) - (3*B*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(4*b^4*g^5*(a + b*x)^2) - (B*d^3*i^3*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(2*b^4*g^5*(a + b*x)) - (B*d^4*i^3*Log[a + b*x]*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(2*b^4*(b*c - a*d)*g^5) - ((b*c - a*d)^3*i^3*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b^4*g^5*(a + b*x)^4) - (d*(b*c - a*d
)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*g^5*(a + b*x)^3) - (3*
d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^4*g^5*(a +
 b*x)^2) - (d^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(b^4*g^5*(a + b
*x)) + (B^2*d^4*i^3*Log[c + d*x])/(8*b^4*(b*c - a*d)*g^5) - (B^2*d^4*i^3*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*b^4*(b*c - a*d)*g^5) + (B*
d^4*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(2*b^4*(b*c - a*
d)*g^5) + (B^2*d^4*i^3*Log[c + d*x]^2)/(4*b^4*(b*c - a*d)*g^5) - (B^2*d^4*i
^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(2*b^4*(b*c - a*d)*g^5) - (
B^2*d^4*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(2*b^4*(b*c - a*d)*g^
5) - (B^2*d^4*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(2*b^4*(b*c - a*d)
*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(81c+81dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx = \int\left(\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^5(a+bx)^5} + \frac{1594323d(bc-ad)^2\left(A+B\,\mathrm{l}\cdots\right.}{b^3g^5(a+bx)^4}\cdots\right.$$

$$= \frac{\left(531441d^3\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}dx}{b^3g^5} + \frac{\left(1594323d^2(bc-ad)\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\cdots\right.}{(a+bx)^3}}{b^3g^5}\cdots$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-ad)^2\left(A+B\log\left(\cdots\right.\right.}{b^4g^5(a+bx)^3}\cdots$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-ad)^2\left(A+B\log\left(\cdots\right.\right.}{b^4g^5(a+bx)^3}\cdots$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-ad)^2\left(A+B\log\left(\cdots\right.\right.}{b^4g^5(a+bx)^3}\cdots$$

$$= -\frac{531441(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b^4g^5(a+bx)^4} - \frac{531441d(bc-ad)^2\left(A+B\log\left(\cdots\right.\right.}{b^4g^5(a+bx)^3}\cdots$$

$$= -\frac{531441B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^4g^5(a+bx)^4} - \frac{531441Bd(bc-ad)^2\left(A+B\log\cdots\right.}{2b^4g^5(a+bx)^3}\cdots$$

$$= -\frac{531441B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^4g^5(a+bx)^4} - \frac{531441Bd(bc-ad)^2\left(A+B\log\cdots\right.}{2b^4g^5(a+bx)^3}\cdots$$

$$= -\frac{531441B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8b^4g^5(a+bx)^4} - \frac{531441Bd(bc-ad)^2\left(A+B\log\cdots\right.}{2b^4g^5(a+bx)^3}\cdots$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B^2d^2(bc-ad)}{16b^4g^5(a+bx)^2} + \cdots$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B^2d^2(bc-ad)}{16b^4g^5(a+bx)^2} + \cdots$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B^2d^2(bc-ad)}{16b^4g^5(a+bx)^2} + \cdots$$

$$= -\frac{531441B^2(bc-ad)^3}{32b^4g^5(a+bx)^4} - \frac{531441B^2d(bc-ad)^2}{8b^4g^5(a+bx)^3} - \frac{1594323B^2d^2(bc-ad)}{16b^4g^5(a+bx)^2} + \cdots$$

Mathematica [C] time = 1.54465, size = 2470, normalized size = 16.8

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^5,x]
```

```
[Out] -(i^3*(8*A^2*b^4*c^4 + 4*A*b^4*B*c^4 + b^4*B^2*c^4 - 8*a^4*A^2*d^4 - 4*a^4*
A*B*d^4 - a^4*B^2*d^4 + 32*A^2*b^4*c^3*d*x + 16*A*b^4*B*c^3*d*x + 4*b^4*B^2
*c^3*d*x - 32*a^3*A^2*b*d^4*x - 16*a^3*A*b*B*d^4*x - 4*a^3*b*B^2*d^4*x + 48
*A^2*b^4*c^2*d^2*x^2 + 24*A*b^4*B*c^2*d^2*x^2 + 6*b^4*B^2*c^2*d^2*x^2 - 48*
a^2*A^2*b^2*d^4*x^2 - 24*a^2*A*b^2*B*d^4*x^2 - 6*a^2*b^2*B^2*d^4*x^2 + 32*A
^2*b^4*c*d^3*x^3 + 16*A*b^4*B*c*d^3*x^3 + 4*b^4*B^2*c*d^3*x^3 - 32*a*A^2*b^
3*d^4*x^3 - 16*a*A*b^3*B*d^4*x^3 - 4*a*b^3*B^2*d^4*x^3 + 16*a^4*A*B*d^4*Log
[a + b*x] + 4*a^4*B^2*d^4*Log[a + b*x] + 64*a^3*A*b*B*d^4*x*Log[a + b*x] +
16*a^3*b*B^2*d^4*x*Log[a + b*x] + 96*a^2*A*b^2*B*d^4*x^2*Log[a + b*x] + 24*
a^2*b^2*B^2*d^4*x^2*Log[a + b*x] + 64*a*A*b^3*B*d^4*x^3*Log[a + b*x] + 16*a
*b^3*B^2*d^4*x^3*Log[a + b*x] + 16*A*b^4*B*d^4*x^4*Log[a + b*x] + 4*b^4*B^2
*d^4*x^4*Log[a + b*x] - 8*a^4*B^2*d^4*Log[a + b*x]^2 - 32*a^3*b*B^2*d^4*x*L
og[a + b*x]^2 - 48*a^2*b^2*B^2*d^4*x^2*Log[a + b*x]^2 - 32*a*b^3*B^2*d^4*x^
3*Log[a + b*x]^2 - 8*b^4*B^2*d^4*x^4*Log[a + b*x]^2 + 16*A*b^4*B*c^4*Log[(e
*(a + b*x))/(c + d*x)] + 4*b^4*B^2*c^4*Log[(e*(a + b*x))/(c + d*x)] - 16*a^
4*A*B*d^4*Log[(e*(a + b*x))/(c + d*x)] - 4*a^4*B^2*d^4*Log[(e*(a + b*x))/(c
 + d*x)] + 64*A*b^4*B*c^3*d*x*Log[(e*(a + b*x))/(c + d*x)] + 16*b^4*B^2*c^3
*d*x*Log[(e*(a + b*x))/(c + d*x)] - 64*a^3*A*b*B*d^4*x*Log[(e*(a + b*x))/(c
 + d*x)] - 16*a^3*b*B^2*d^4*x*Log[(e*(a + b*x))/(c + d*x)] + 96*A*b^4*B*c^2
*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] + 24*b^4*B^2*c^2*d^2*x^2*Log[(e*(a +
b*x))/(c + d*x)] - 96*a^2*A*b^2*B*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)] - 24
*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)] + 64*A*b^4*B*c*d^3*x^3*Lo
g[(e*(a + b*x))/(c + d*x)] + 16*b^4*B^2*c*d^3*x^3*Log[(e*(a + b*x))/(c + d*
x)] - 64*a*A*b^3*B*d^4*x^3*Log[(e*(a + b*x))/(c + d*x)] - 16*a*b^3*B^2*d^4*
x^3*Log[(e*(a + b*x))/(c + d*x)] + 16*a^4*B^2*d^4*Log[a + b*x]*Log[(e*(a +
b*x))/(c + d*x)] + 64*a^3*b*B^2*d^4*x*Log[a + b*x]*Log[(e*(a + b*x))/(c + d
*x)] + 96*a^2*b^2*B^2*d^4*x^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 6
4*a*b^3*B^2*d^4*x^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 16*b^4*B^2*
d^4*x^4*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 8*b^4*B^2*c^4*Log[(e*(a
 + b*x))/(c + d*x)]^2 - 8*a^4*B^2*d^4*Log[(e*(a + b*x))/(c + d*x)]^2 + 32*b
^4*B^2*c^3*d*x*Log[(e*(a + b*x))/(c + d*x)]^2 - 32*a^3*b*B^2*d^4*x*Log[(e*(
a + b*x))/(c + d*x)]^2 + 48*b^4*B^2*c^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)
]^2 - 48*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 32*b^4*B^2*c*
d^3*x^3*Log[(e*(a + b*x))/(c + d*x)]^2 - 32*a*b^3*B^2*d^4*x^3*Log[(e*(a + b
*x))/(c + d*x)]^2 - 16*a^4*A*B*d^4*Log[c + d*x] - 4*a^4*B^2*d^4*Log[c + d*x
] - 64*a^3*A*b*B*d^4*x*Log[c + d*x] - 16*a^3*b*B^2*d^4*x*Log[c + d*x] - 96*
a^2*A*b^2*B*d^4*x^2*Log[c + d*x] - 24*a^2*b^2*B^2*d^4*x^2*Log[c + d*x] - 64
*a*A*b^3*B*d^4*x^3*Log[c + d*x] - 16*a*b^3*B^2*d^4*x^3*Log[c + d*x] - 16*A*
b^4*B*d^4*x^4*Log[c + d*x] - 4*b^4*B^2*d^4*x^4*Log[c + d*x] + 16*a^4*B^2*d^
4*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 64*a^3*b*B^2*d^4*x*Log[(
d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 96*a^2*b^2*B^2*d^4*x^2*Log[(d*(
a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 64*a*b^3*B^2*d^4*x^3*Log[(d*(a + b
*x))/(-(b*c) + a*d)]*Log[c + d*x] + 16*b^4*B^2*d^4*x^4*Log[(d*(a + b*x))/(-
(b*c) + a*d)]*Log[c + d*x] - 16*a^4*B^2*d^4*Log[(e*(a + b*x))/(c + d*x)]*Lo
g[c + d*x] - 64*a^3*b*B^2*d^4*x*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] -
 96*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 64*a*b^
3*B^2*d^4*x^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 16*b^4*B^2*d^4*x^
4*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 8*a^4*B^2*d^4*Log[c + d*x]^2
- 32*a^3*b*B^2*d^4*x*Log[c + d*x]^2 - 48*a^2*b^2*B^2*d^4*x^2*Log[c + d*x]^2
 - 32*a*b^3*B^2*d^4*x^3*Log[c + d*x]^2 - 8*b^4*B^2*d^4*x^4*Log[c + d*x]^2 +
 16*a^4*B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 64*a^3*b*B^2*
d^4*x*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 96*a^2*b^2*B^2*d^4*x^2*
Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 64*a*b^3*B^2*d^4*x^3*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 16*b^4*B^2*d^4*x^4*Log[a + b*x]*Log[(
b*(c + d*x))/(b*c - a*d)] + 16*B^2*d^4*(a + b*x)^4*PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)] + 16*B^2*d^4*(a + b*x)^4*PolyLog[2, (b*(c + d*x))/(b*c - a
```

```
*d)]))/(32*b^4*(b*c - a*d)*g^5*(a + b*x)^4)
```

Maple [B] time = 0.053, size = 890, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x)
```

```
[Out] 1/4*e^4*d*i^3/(a*d-b*c)^2/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1
/4*e^4*i^3/(a*d-b*c)^2/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c+1/
2*e^4*d*i^3/(a*d-b*c)^2/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^4*i^3/(a*d-b*c)^2/g^5*A*B/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/8*e^4*d*i^3/(
a*d-b*c)^2/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/8*e^4*i^3/(a*d
-b*c)^2/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c+1/4*e^4*d*i^3/(a*
d-b*c)^2/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2*a-1/4*e^4*i^3/(a*d-b*c)^2/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1/8*e^4*d*i^3/(a*d-b*c)^2/
g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*a-1/8*e^4*i^3/(a*d-b*c)^2/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/32*e^4*d*i^3/(a*d-b*c)^2/g^5*B^2/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/32*e^4*i^3/(a*d-b*c)^2/g^5*B^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c
```

Maxima [B] time = 6.38507, size = 15779, normalized size = 107.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="maxima")
```

```
[Out] -1/4*(4*b*x + a)*B^2*c^2*d*i^3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*
g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g
^5) - 1/4*(6*b^2*x^2 + 4*a*b*x + a^2)*B^2*c*d^2*i^3*log(b*e*x/(d*x + c) + a
*e/(d*x + c))^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*
b^4*g^5*x + a^4*b^3*g^5) - 1/4*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*
B^2*d^3*i^3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^5*x^4 + 4*a*b^7*g
^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + 1/288*(12*((1
2*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 -
6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d
^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 +
 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 +
6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 +
 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x +
(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4
*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d
^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^
2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*e*x/(d*x + c) + a*
e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*
b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2
```

```
 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x
^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*
d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*lo
g(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*
a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a
^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3
 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4
*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))
*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g
^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*b^8*c^3*d*g^5
 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g^5)*x^4 + 4*(
a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 - 4*a^4*b^5*c*d
^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6*c^3*d*g^5 +
6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)*x^2 + 4*(a^3
*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4*a^6*b^3*c*d^
3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c^3*i^3 - 1/288*(12*((7*a*b^3*c^3 - 33*a^2
*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3
 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21
*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*
d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d
 + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*
d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2
*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d
+ 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)
/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*
d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d +
 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5))*log(b*e*x/(d*x +
c) + a*e/(d*x + c)) + (37*a*b^4*c^4 - 304*a^2*b^3*c^3*d + 1512*a^3*b^2*c^2*
d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 + 12*(88*b^5*c^2*d^2 - 101*a*b^4*c*d^3
 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5*c^3*d - 609*a*b^4*c^2*d^2 + 648*a^2*b^3*
c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 -
a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 -
 a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x + a)^2 - 72*
(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3
 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*
c*d^3 - a^4*b*d^4)*x)*log(d*x + c)^2 + 4*(16*b^5*c^4 - 163*a*b^4*c^3*d + 10
68*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*c*d^3 + 115*a^4*b*d^4)*x + 12*(88*a^4*b*c
*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 -
 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^
3*b^2*c*d^3 - 13*a^4*b*d^4)*x)*log(b*x + a) - 12*(88*a^4*b*c*d^3 - 13*a^5*d
^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4
)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 1
3*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^
4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)
*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(b*x + a))*log(d*x + c))/(a^4*
b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*g^5 + 6*a^6*b^4*c^2*d^2*g^5 - 4*a^7*b^3*c*d^3
*g^5 + a^8*b^2*d^4*g^5 + (b^10*c^4*g^5 - 4*a*b^9*c^3*d*g^5 + 6*a^2*b^8*c^2*
d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 + a^4*b^6*d^4*g^5)*x^4 + 4*(a*b^9*c^4*g^5 - 4
*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*d^2*g^5 - 4*a^4*b^6*c*d^3*g^5 + a^5*b^5*
d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 - 4*a^3*b^7*c^3*d*g^5 + 6*a^4*b^6*c^2*d^2
*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6*b^4*d^4*g^5)*x^2 + 4*(a^3*b^7*c^4*g^5 - 4*
a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2*d^2*g^5 - 4*a^6*b^4*c*d^3*g^5 + a^7*b^3*d
^4*g^5)*x))*B^2*c^2*d*i^3 - 1/288*(12*((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d +
 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3
)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x
^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x
)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(
a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a
^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(
```

a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4
*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^
2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d +
6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^
2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b
^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5))*log(b*e*x/(d*x + c) + a*e
/(d*x + c)) + (115*a^2*b^4*c^4 - 1360*a^3*b^3*c^3*d + 1512*a^4*b^2*c^2*d^2
- 304*a^5*b*c*d^3 + 37*a^6*d^4 - 12*(108*b^6*c^3*d - 148*a*b^5*c^2*d^2 + 47
*a^2*b^4*c*d^3 - 7*a^3*b^3*d^4)*x^3 + 6*(36*b^6*c^4 - 712*a*b^5*c^3*d + 903
*a^2*b^4*c^2*d^2 - 264*a^3*b^3*c*d^3 + 37*a^4*b^2*d^4)*x^2 + 72*(6*a^4*b^2*
c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^
4*d^4)*x^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6
*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^
2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x)*log(b*x + a)^2 + 72*(6*a^4*b^2*c^2*d^2
- 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x
^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4
*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^
4*b^2*c*d^3 + a^5*b*d^4)*x)*log(d*x + c)^2 + 4*(76*a*b^5*c^4 - 1057*a^2*b^4
*c^3*d + 1248*a^3*b^3*c^2*d^2 - 304*a^4*b^2*c*d^3 + 37*a^5*b*d^4)*x - 12*(1
08*a^4*b^2*c^2*d^2 - 40*a^5*b*c*d^3 + 7*a^6*d^4 + (108*b^6*c^2*d^2 - 40*a*b
^5*c*d^3 + 7*a^2*b^4*d^4)*x^4 + 4*(108*a*b^5*c^2*d^2 - 40*a^2*b^4*c*d^3 + 7
*a^3*b^3*d^4)*x^3 + 6*(108*a^2*b^4*c^2*d^2 - 40*a^3*b^3*c*d^3 + 7*a^4*b^2*d
^4)*x^2 + 4*(108*a^3*b^3*c^2*d^2 - 40*a^4*b^2*c*d^3 + 7*a^5*b*d^4)*x)*log(b
x + a) + 12(108*a^4*b^2*c^2*d^2 - 40*a^5*b*c*d^3 + 7*a^6*d^4 + (108*b^6*c
^2*d^2 - 40*a*b^5*c*d^3 + 7*a^2*b^4*d^4)*x^4 + 4*(108*a*b^5*c^2*d^2 - 40*a^
2*b^4*c*d^3 + 7*a^3*b^3*d^4)*x^3 + 6*(108*a^2*b^4*c^2*d^2 - 40*a^3*b^3*c*d^
3 + 7*a^4*b^2*d^4)*x^2 + 4*(108*a^3*b^3*c^2*d^2 - 40*a^4*b^2*c*d^3 + 7*a^5*
b*d^4)*x - 12*(6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^6*c^2*d^2
- 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b^4*c*d^3
+ a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*
x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x)*log(b*x + a))*
log(d*x + c))/(a^4*b^7*c^4*g^5 - 4*a^5*b^6*c^3*d*g^5 + 6*a^6*b^5*c^2*d^2*g^
5 - 4*a^7*b^4*c*d^3*g^5 + a^8*b^3*d^4*g^5 + (b^11*c^4*g^5 - 4*a*b^10*c^3*d*
g^5 + 6*a^2*b^9*c^2*d^2*g^5 - 4*a^3*b^8*c*d^3*g^5 + a^4*b^7*d^4*g^5)*x^4 +
4*(a*b^10*c^4*g^5 - 4*a^2*b^9*c^3*d*g^5 + 6*a^3*b^8*c^2*d^2*g^5 - 4*a^4*b^7
*c*d^3*g^5 + a^5*b^6*d^4*g^5)*x^3 + 6*(a^2*b^9*c^4*g^5 - 4*a^3*b^8*c^3*d*g^
5 + 6*a^4*b^7*c^2*d^2*g^5 - 4*a^5*b^6*c*d^3*g^5 + a^6*b^5*d^4*g^5)*x^2 + 4*
(a^3*b^8*c^4*g^5 - 4*a^4*b^7*c^3*d*g^5 + 6*a^5*b^6*c^2*d^2*g^5 - 4*a^6*b^5*
c*d^3*g^5 + a^7*b^4*d^4*g^5)*x))*B^2*c*d^2*i^3 - 1/288*(12*((25*a^3*b^3*c^3
- 23*a^4*b^2*c^2*d + 13*a^5*b*c*d^2 - 3*a^6*d^3 + 12*(4*b^6*c^3 - 6*a*b^5*
c^2*d + 4*a^2*b^4*c*d^2 - a^3*b^3*d^3)*x^3 + 6*(18*a*b^5*c^3 - 22*a^2*b^4*c
^2*d + 13*a^3*b^3*c*d^2 - 3*a^4*b^2*d^3)*x^2 + 4*(22*a^2*b^4*c^3 - 23*a^3*b
^3*c^2*d + 13*a^4*b^2*c*d^2 - 3*a^5*b*d^3)*x)/((b^11*c^3 - 3*a*b^10*c^2*d +
3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^5*x^4 + 4*(a*b^10*c^3 - 3*a^2*b^9*c^2*d +
3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^5*x^3 + 6*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d
+ 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^5*x^2 + 4*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d
+ 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^5*x + (a^4*b^7*c^3 - 3*a^5*b^6*c^2*d +
3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^5) + 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4
*a^2*b*c*d^3 - a^3*d^4)*log(b*x + a)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*
c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5) - 12*(4*b^3*c^3*d - 6*a*b^2*c
^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log(d*x + c)/((b^8*c^4 - 4*a*b^7*c^3*d +
6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5))*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) + (415*a^3*b^4*c^4 - 576*a^4*b^3*c^3*d + 216*a^5*b^2*c^2
*d^2 - 64*a^6*b*c*d^3 + 9*a^7*d^4 + 12*(48*b^7*c^4 - 84*a*b^6*c^3*d + 52*a^
2*b^5*c^2*d^2 - 19*a^3*b^4*c*d^3 + 3*a^4*b^3*d^4)*x^3 + 6*(252*a*b^6*c^4 -
400*a^2*b^5*c^3*d + 203*a^3*b^4*c^2*d^2 - 64*a^4*b^3*c*d^3 + 9*a^5*b^2*d^4)
x^2 - 72(4*a^4*b^3*c^3*d - 6*a^5*b^2*c^2*d^2 + 4*a^6*b*c*d^3 - a^7*d^4 +
(4*b^7*c^3*d - 6*a*b^6*c^2*d^2 + 4*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^4 + 4*(4*
a*b^6*c^3*d - 6*a^2*b^5*c^2*d^2 + 4*a^3*b^4*c*d^3 - a^4*b^3*d^4)*x^3 + 6*(4

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*a^2*b^5*c^3*d - 6*a^3*b^4*c^2*d^2 + 4*a^4*b^3*c*d^3 - a^5*b^2*d^4)*x^2 + 4
*(4*a^3*b^4*c^3*d - 6*a^4*b^3*c^2*d^2 + 4*a^5*b^2*c*d^3 - a^6*b*d^4)*x)*log
(b*x + a)^2 - 72*(4*a^4*b^3*c^3*d - 6*a^5*b^2*c^2*d^2 + 4*a^6*b*c*d^3 - a^7
*d^4 + (4*b^7*c^3*d - 6*a*b^6*c^2*d^2 + 4*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^4
+ 4*(4*a*b^6*c^3*d - 6*a^2*b^5*c^2*d^2 + 4*a^3*b^4*c*d^3 - a^4*b^3*d^4)*x^3
 + 6*(4*a^2*b^5*c^3*d - 6*a^3*b^4*c^2*d^2 + 4*a^4*b^3*c*d^3 - a^5*b^2*d^4)*
x^2 + 4*(4*a^3*b^4*c^3*d - 6*a^4*b^3*c^2*d^2 + 4*a^5*b^2*c*d^3 - a^6*b*d^4)
*x)*log(d*x + c)^2 + 4*(340*a^2*b^5*c^4 - 501*a^3*b^4*c^3*d + 216*a^4*b^3*c
^2*d^2 - 64*a^5*b^2*c*d^3 + 9*a^6*b*d^4)*x + 12*(48*a^4*b^3*c^3*d - 36*a^5*
b^2*c^2*d^2 + 16*a^6*b*c*d^3 - 3*a^7*d^4 + (48*b^7*c^3*d - 36*a*b^6*c^2*d^2
 + 16*a^2*b^5*c*d^3 - 3*a^3*b^4*d^4)*x^4 + 4*(48*a*b^6*c^3*d - 36*a^2*b^5*c
^2*d^2 + 16*a^3*b^4*c*d^3 - 3*a^4*b^3*d^4)*x^3 + 6*(48*a^2*b^5*c^3*d - 36*a
^3*b^4*c^2*d^2 + 16*a^4*b^3*c*d^3 - 3*a^5*b^2*d^4)*x^2 + 4*(48*a^3*b^4*c^3*
d - 36*a^4*b^3*c^2*d^2 + 16*a^5*b^2*c*d^3 - 3*a^6*b*d^4)*x)*log(b*x + a) -
12*(48*a^4*b^3*c^3*d - 36*a^5*b^2*c^2*d^2 + 16*a^6*b*c*d^3 - 3*a^7*d^4 + (4
8*b^7*c^3*d - 36*a*b^6*c^2*d^2 + 16*a^2*b^5*c*d^3 - 3*a^3*b^4*d^4)*x^4 + 4*
(48*a*b^6*c^3*d - 36*a^2*b^5*c^2*d^2 + 16*a^3*b^4*c*d^3 - 3*a^4*b^3*d^4)*x^
3 + 6*(48*a^2*b^5*c^3*d - 36*a^3*b^4*c^2*d^2 + 16*a^4*b^3*c*d^3 - 3*a^5*b^2
*d^4)*x^2 + 4*(48*a^3*b^4*c^3*d - 36*a^4*b^3*c^2*d^2 + 16*a^5*b^2*c*d^3 - 3
*a^6*b*d^4)*x - 12*(4*a^4*b^3*c^3*d - 6*a^5*b^2*c^2*d^2 + 4*a^6*b*c*d^3 - a
^7*d^4 + (4*b^7*c^3*d - 6*a*b^6*c^2*d^2 + 4*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^
4 + 4*(4*a*b^6*c^3*d - 6*a^2*b^5*c^2*d^2 + 4*a^3*b^4*c*d^3 - a^4*b^3*d^4)*x
^3 + 6*(4*a^2*b^5*c^3*d - 6*a^3*b^4*c^2*d^2 + 4*a^4*b^3*c*d^3 - a^5*b^2*d^4
)*x^2 + 4*(4*a^3*b^4*c^3*d - 6*a^4*b^3*c^2*d^2 + 4*a^5*b^2*c*d^3 - a^6*b*d^
4)*x)*log(b*x + a))*log(d*x + c))/(a^4*b^8*c^4*g^5 - 4*a^5*b^7*c^3*d*g^5 +
6*a^6*b^6*c^2*d^2*g^5 - 4*a^7*b^5*c*d^3*g^5 + a^8*b^4*d^4*g^5 + (b^12*c^4*g
^5 - 4*a*b^11*c^3*d*g^5 + 6*a^2*b^10*c^2*d^2*g^5 - 4*a^3*b^9*c*d^3*g^5 + a^
4*b^8*d^4*g^5)*x^4 + 4*(a*b^11*c^4*g^5 - 4*a^2*b^10*c^3*d*g^5 + 6*a^3*b^9*c
^2*d^2*g^5 - 4*a^4*b^8*c*d^3*g^5 + a^5*b^7*d^4*g^5)*x^3 + 6*(a^2*b^10*c^4*g
^5 - 4*a^3*b^9*c^3*d*g^5 + 6*a^4*b^8*c^2*d^2*g^5 - 4*a^5*b^7*c*d^3*g^5 + a^
6*b^6*d^4*g^5)*x^2 + 4*(a^3*b^9*c^4*g^5 - 4*a^4*b^8*c^3*d*g^5 + 6*a^5*b^7*c
^2*d^2*g^5 - 4*a^6*b^6*c*d^3*g^5 + a^7*b^5*d^4*g^5)*x))*B^2*d^3*i^3 - 1/24*
A*B*d^3*i^3*(12*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*log(b*e*x/(d*x
+ c) + a*e/(d*x + c))/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 +
4*a^3*b^5*g^5*x + a^4*b^4*g^5) + (25*a^3*b^3*c^3 - 23*a^4*b^2*c^2*d + 13*a^
5*b*c*d^2 - 3*a^6*d^3 + 12*(4*b^6*c^3 - 6*a*b^5*c^2*d + 4*a^2*b^4*c*d^2 - a
^3*b^3*d^3)*x^3 + 6*(18*a*b^5*c^3 - 22*a^2*b^4*c^2*d + 13*a^3*b^3*c*d^2 - 3
*a^4*b^2*d^3)*x^2 + 4*(22*a^2*b^4*c^3 - 23*a^3*b^3*c^2*d + 13*a^4*b^2*c*d^2
 - 3*a^5*b*d^3)*x)/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*
d^3)*g^5*x^4 + 4*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*
d^3)*g^5*x^3 + 6*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6
*d^3)*g^5*x^2 + 4*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^
5*d^3)*g^5*x + (a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d
^3)*g^5) + 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log
(b*x + a)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 +
 a^4*b^4*d^4)*g^5) - 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^
3*d^4)*log(d*x + c)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b
^5*c*d^3 + a^4*b^4*d^4)*g^5)) - 1/24*A*B*c*d^2*i^3*(12*(6*b^2*x^2 + 4*a*b*x
 + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3
 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 7
5*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*
d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 -
 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2
 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d
^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^
3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d
^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*
d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3
)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4
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- 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) +
 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^
6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/24*A
*B*c^2*d*i^3*(12*(4*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*
x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5)
+ (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4
*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*
x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/(
(b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^
8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b
^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*
b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5
*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^
3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a
^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^
6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*
g^5)) + 1/24*A*B*c^3*i^3*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23
*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d
- 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*
d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d
^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*
d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c
*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^
2 - a^7*b*d^3)*g^5) - 12*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4
+ 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d
^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c
*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*
a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*B^2*c^3*i^3*log(
b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b
^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*(4*b*x + a)*A^2*c^2*d*i^3/(
b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b
^2*g^5) - 1/4*(6*b^2*x^2 + 4*a*b*x + a^2)*A^2*c*d^2*i^3/(b^7*g^5*x^4 + 4*a*
b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/4*(4*b
^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*A^2*d^3*i^3/(b^8*g^5*x^4 + 4*a*b^7*
g^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) - 1/4*A^2*c^3*
i^3/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x +
a^4*b*g^5)
```

Fricas [B] time = 0.584212, size = 1127, normalized size = 7.67

$$-\frac{4\left(\left(8A^2+4AB+B^2\right)b^4cd^3-\left(8A^2+4AB+B^2\right)ab^3d^4\right)i^3x^3+6\left(\left(8A^2+4AB+B^2\right)b^4c^2d^2-\left(8A^2+4AB+B^2\right)a^2b^2\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="fricas")
```

```
[Out] -1/32*(4*((8*A^2 + 4*A*B + B^2)*b^4*c*d^3 - (8*A^2 + 4*A*B + B^2)*a*b^3*d^4
)*i^3*x^3 + 6*((8*A^2 + 4*A*B + B^2)*b^4*c^2*d^2 - (8*A^2 + 4*A*B + B^2)*a^
2*b^2*d^4)*i^3*x^2 + 4*((8*A^2 + 4*A*B + B^2)*b^4*c^3*d - (8*A^2 + 4*A*B +
B^2)*a^3*b*d^4)*i^3*x + ((8*A^2 + 4*A*B + B^2)*b^4*c^4 - (8*A^2 + 4*A*B + B
^2)*a^4*d^4)*i^3 + 8*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2
*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log((b*e*x
+ a*e)/(d*x + c))^2 + 4*((4*A*B + B^2)*b^4*d^4*i^3*x^4 + 4*(4*A*B + B^2)*b^
4*c*d^3*i^3*x^3 + 6*(4*A*B + B^2)*b^4*c^2*d^2*i^3*x^2 + 4*(4*A*B + B^2)*b^4
```

```
*c^3*d*i^3*x + (4*A*B + B^2)*b^4*c^4*i^3)*log((b*e*x + a*e)/(d*x + c)))/((b
^9*c - a*b^8*d)*g^5*x^4 + 4*(a*b^8*c - a^2*b^7*d)*g^5*x^3 + 6*(a^2*b^7*c -
a^3*b^6*d)*g^5*x^2 + 4*(a^3*b^6*c - a^4*b^5*d)*g^5*x + (a^4*b^5*c - a^5*b^4
*d)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^5, x)
```

3.82 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=299

$$-\frac{bi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{5g^6(a+bx)^5(bc-ad)^2}-\frac{2bBi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{25g^6(a+bx)^5(bc-ad)^2}+\frac{di^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^6(a+bx)^4(bc-ad)^2}+\frac{Bdi^3(\ldots}{\ldots}$$

```
[Out] (B^2*d*i^3*(c + d*x)^4)/(32*(b*c - a*d)^2*g^6*(a + b*x)^4) - (2*b*B^2*i^3*(
c + d*x)^5)/(125*(b*c - a*d)^2*g^6*(a + b*x)^5) + (B*d*i^3*(c + d*x)^4*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)^2*g^6*(a + b*x)^4) - (2*b*
B*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(25*(b*c - a*d)^2*g
^6*(a + b*x)^5) + (d*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2
)/(4*(b*c - a*d)^2*g^6*(a + b*x)^4) - (b*i^3*(c + d*x)^5*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(5*(b*c - a*d)^2*g^6*(a + b*x)^5)
```

Rubi [C] time = 5.19533, antiderivative size = 1061, normalized size of antiderivative = 3.55, number of steps used = 146, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.262, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2i^3\log^2(a+bx)d^5}{20b^4(bc-ad)^2g^6}-\frac{B^2i^3\log^2(c+dx)d^5}{20b^4(bc-ad)^2g^6}+\frac{9B^2i^3\log(a+bx)d^5}{200b^4(bc-ad)^2g^6}+\frac{Bi^3\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^5}{10b^4(bc-ad)^2g^6}-\frac{9B^2i^3\log\ldots}{200b^4(b\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
6,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^3*i^3)/(125*b^4*g^6*(a + b*x)^5) - (39*B^2*d*(b*c - a*d
)^2*i^3)/(800*b^4*g^6*(a + b*x)^4) - (7*B^2*d^2*(b*c - a*d)*i^3)/(200*b^4*g
^6*(a + b*x)^3) + (11*B^2*d^3*i^3)/(400*b^4*g^6*(a + b*x)^2) + (9*B^2*d^4*i
^3)/(200*b^4*(b*c - a*d)*g^6*(a + b*x)) + (9*B^2*d^5*i^3*Log[a + b*x])/(200
*b^4*(b*c - a*d)^2*g^6) - (B^2*d^5*i^3*Log[a + b*x]^2)/(20*b^4*(b*c - a*d)^
2*g^6) - (2*B*(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(25*b
^4*g^6*(a + b*x)^5) - (11*B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(40*b^4*g^6*(a + b*x)^4) - (3*B*d^2*(b*c - a*d)*i^3*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(10*b^4*g^6*(a + b*x)^3) - (B*d^3*i^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(20*b^4*g^6*(a + b*x)^2) + (B*d^4*i^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(10*b^4*(b*c - a*d)*g^6*(a + b*x)) + (B*d^5*i^3
*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4*(b*c - a*d)^2*g
^6) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*b^4*g^6
*(a + b*x)^5) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2)/(4*b^4*g^6*(a + b*x)^4) - (d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2)/(b^4*g^6*(a + b*x)^3) - (d^3*i^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)])^2)/(2*b^4*g^6*(a + b*x)^2) - (9*B^2*d^5*i^3*Log[c + d*x])/(200*b
^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
c + d*x])/(10*b^4*(b*c - a*d)^2*g^6) - (B*d^5*i^3*(A + B*Log[(e*(a + b*x))/
(c + d*x)])*Log[c + d*x])/(10*b^4*(b*c - a*d)^2*g^6) - (B^2*d^5*i^3*Log[c +
 d*x]^2)/(20*b^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*Log[a + b*x]*Log[(b*(c +
 d*x))/(b*c - a*d)])/(10*b^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*PolyLog[2, -
((d*(a + b*x))/(b*c - a*d))])/(10*b^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/(10*b^4*(b*c - a*d)^2*g^6)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(82c+82dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^6}\,dx = \int\left(\frac{551368(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^6(a+bx)^6} + \frac{1654104d(bc-ad)^2\left(A+\cdots\right.}{b^3g^6(a+b\cdots}\right.$$

$$= \frac{\left(551368d^3\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^3}dx}{b^3g^6} + \frac{\left(1654104d^2(bc-ad)\right)\int\frac{\left(A+B\log\left(\frac{e(a\cdots}{c+\cdots}\right.\right.}{(a+bx)^4}\cdots}{b^3g^6}$$

$$= -\frac{551368(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-ad)^2\left(A+B\,\mathrm{l}\cdots\right.}{b^4g^6(a+bx)^4}$$

$$= -\frac{551368(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-ad)^2\left(A+B\,\mathrm{l}\cdots\right.}{b^4g^6(a+bx)^4}$$

$$= -\frac{551368(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-ad)^2\left(A+B\,\mathrm{l}\cdots\right.}{b^4g^6(a+bx)^4}$$

$$= -\frac{551368(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b^4g^6(a+bx)^5} - \frac{413526d(bc-ad)^2\left(A+B\,\mathrm{l}\cdots\right.}{b^4g^6(a+bx)^4}$$

$$= -\frac{1102736B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^4g^6(a+bx)^5} - \frac{758131Bd(bc-ad)^2\left(A+\cdots\right.}{5b^4g^6(a+bx\cdots}$$

$$= -\frac{1102736B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^4g^6(a+bx)^5} - \frac{758131Bd(bc-ad)^2\left(A+\cdots\right.}{5b^4g^6(a+bx\cdots}$$

$$= -\frac{1102736B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{25b^4g^6(a+bx)^5} - \frac{758131Bd(bc-ad)^2\left(A+\cdots\right.}{5b^4g^6(a+bx\cdots}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B^2d^2(bc-ad\cdots}{25b^4g^6(a+bx)^3}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B^2d^2(bc-ad\cdots}{25b^4g^6(a+bx)^3}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B^2d^2(bc-ad\cdots}{25b^4g^6(a+bx)^3}$$

$$= -\frac{1102736B^2(bc-ad)^3}{125b^4g^6(a+bx)^5} - \frac{2687919B^2d(bc-ad)^2}{100b^4g^6(a+bx)^4} - \frac{482447B^2d^2(bc-ad\cdots}{25b^4g^6(a+bx)^3}$$

Mathematica [C] time = 4.47046, size = 2289, normalized size = 7.66

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^6,x]
```

```
[Out] (i^3*(2000*a^2*B^2*d^2*(b*c - a*d)^3 - 825*a*B^2*d*(b*c - a*d)^4 - 192*B^2*
(b*c - a*d)^5 + 4000*a*b*B^2*d^2*(b*c - a*d)^3*x - 825*b*B^2*d*(b*c - a*d)^
```

```
4*x + 2000*b^2*B^2*d^2*(b*c - a*d)^3*x^2 - 3000*a^2*B^2*d^3*(b*c - a*d)^2*(
a + b*x) + 1100*a*B^2*d^2*(b*c - a*d)^3*(a + b*x) + 240*B^2*d*(b*c - a*d)^4
*(a + b*x) - 6000*a*b*B^2*d^3*(b*c - a*d)^2*x*(a + b*x) + 1100*b*B^2*d^2*(b
*c - a*d)^3*x*(a + b*x) - 3000*b^2*B^2*d^3*(b*c - a*d)^2*x^2*(a + b*x) + 60
00*a^2*B^2*d^4*(b*c - a*d)*(a + b*x)^2 - 6150*a*B^2*d^3*(b*c - a*d)^2*(a +
b*x)^2 + 3520*B^2*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 12000*a*b*B^2*d^4*(b*c
 - a*d)*x*(a + b*x)^2 - 6150*b*B^2*d^3*(b*c - a*d)^2*x*(a + b*x)^2 + 6000*b
^2*B^2*d^4*(b*c - a*d)*x^2*(a + b*x)^2 + 18000*a*b*B^2*c*d^4*(a + b*x)^3 -
18000*a^2*B^2*d^5*(a + b*x)^3 + 12300*a*B^2*d^4*(b*c - a*d)*(a + b*x)^3 + 9
480*B^2*d^3*(b*c - a*d)^2*(a + b*x)^3 + 18000*b^2*B^2*c*d^4*x*(a + b*x)^3 -
 18000*a*b*B^2*d^5*x*(a + b*x)^3 + 12300*b*B^2*d^4*(b*c - a*d)*x*(a + b*x)^
3 - 16800*b*B^2*c*d^4*(a + b*x)^4 + 16800*a*B^2*d^5*(a + b*x)^4 + 18960*B^2
*d^4*(-(b*c) + a*d)*(a + b*x)^4 + 6000*a^2*B^2*d^5*(a + b*x)^3*Log[a + b*x]
 + 12000*a*b*B^2*d^5*x*(a + b*x)^3*Log[a + b*x] + 6000*b^2*B^2*d^5*x^2*(a +
 b*x)^3*Log[a + b*x] + 30300*a*B^2*d^5*(a + b*x)^4*Log[a + b*x] + 30300*b*B
^2*d^5*x*(a + b*x)^4*Log[a + b*x] - 35760*B^2*d^5*(a + b*x)^5*Log[a + b*x]
- 4500*a*B*d*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 960*B*(b*
c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4500*b*B*d*(b*c - a*d)^4*
x*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6000*a*B*d^2*(b*c - a*d)^3*(a + b*
x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 1200*B*d*(b*c - a*d)^4*(a + b*x)*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6000*b*B*d^2*(b*c - a*d)^3*x*(a + b*
x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 9000*a*B*d^3*(b*c - a*d)^2*(a + b
*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 9600*B*d^2*(-(b*c) + a*d)^3*(a
 + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 9000*b*B*d^3*(b*c - a*d)^2
*x*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*a*B*d^4*(b*c -
a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8400*B*d^3*(b*c - a
*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*b*B*d^4*(b*c
 - a*d)*x*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 16800*B*d^4*(-
(b*c) + a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*a*B*d
^5*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 18000*b*
B*d^5*x*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 168
00*B*d^5*(a + b*x)^5*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24
00*(b*c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 9000*d*(b*c - a*d
)^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 12000*d^2*(-(b*c) +
a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 6000*d^3*(b*c -
 a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 6000*a^2*B^2*d
^5*(a + b*x)^3*Log[c + d*x] - 12000*a*b*B^2*d^5*x*(a + b*x)^3*Log[c + d*x]
- 6000*b^2*B^2*d^5*x^2*(a + b*x)^3*Log[c + d*x] - 30300*a*B^2*d^5*(a + b*x)
^4*Log[c + d*x] - 30300*b*B^2*d^5*x*(a + b*x)^4*Log[c + d*x] + 35760*B^2*d^
5*(a + b*x)^5*Log[c + d*x] - 18000*a*B*d^5*(a + b*x)^4*(A + B*Log[(e*(a + b
*x))/(c + d*x)])*Log[c + d*x] - 18000*b*B*d^5*x*(a + b*x)^4*(A + B*Log[(e*(
a + b*x))/(c + d*x)])*Log[c + d*x] + 16800*B*d^5*(a + b*x)^5*(A + B*Log[(e*
(a + b*x))/(c + d*x)])*Log[c + d*x] - 9000*a*B^2*d^5*(a + b*x)^4*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) - 9000*b*B^2*d^5*x*(a + b*x)^4*(Log[a + b*x]*(Log[
a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)]) + 8400*B^2*d^5*(a + b*x)^5*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)
]) + 9000*a*B^2*d^5*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 9000*b
*B^2*d^5*x*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x]
)*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 8400*B^2*d^5*(a
 + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12000*b^4*(b*c - a*d)^2*g^6
*(a + b*x)^5)
```

Maple [B] time = 0.055, size = 1814, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x)
```

```
[Out] 1/4*e^4*d^2*i^3/(a*d-b*c)^3/g^6*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a
-1/4*e^4*d*i^3/(a*d-b*c)^3/g^6*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*
c-1/5*e^5*d*i^3/(a*d-b*c)^3/g^6*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5
*a+1/5*e^5*i^3/(a*d-b*c)^3/g^6*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^
5*c+1/2*e^4*d^2*i^3/(a*d-b*c)^3/g^6*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^4*d*i^3/(a*d-b*c)^3/g^6*A*B/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/8*e
^4*d^2*i^3/(a*d-b*c)^3/g^6*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/8*
e^4*d*i^3/(a*d-b*c)^3/g^6*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c-2/5
*e^5*d*i^3/(a*d-b*c)^3/g^6*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/5*e^5*i^3/(a*d-b*c)^3/g^6*A*B*b^2/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/25*e^5*d*i
^3/(a*d-b*c)^3/g^6*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+2/25*e^5*i
^3/(a*d-b*c)^3/g^6*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c+1/4*e^4*
d^2*i^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2*a-1/4*e^4*d*i^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1/8*e^4*d^2*i
^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*a-1/8*e^4*d*i^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/32*e^4*d^2*i^3/(a*d-
b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/32*e^4*d*i^3/(a*d-
b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c-1/5*e^5*d*i^3/(a*d
-b*c)^3/g^6*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2*a+1/5*e^5*i^3/(a*d-b*c)^3/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-2/25*e^5*d*i^3/(a*d-b*c
)^3/g^6*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))*a+2/25*e^5*i^3/(a*d-b*c)^3/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/125*e^5*d*i^3/(a*d-b*c)^3/g^
6*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+2/125*e^5*i^3/(a*d-b*c)^3/g
^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c
```

Maxima [B] time = 9.61578, size = 21283, normalized size = 71.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="maxima")
```

```
[Out] -3/20*(5*b*x + a)*B^2*c^2*d*i^3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^7
*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^
4*b^3*g^6*x + a^5*b^2*g^6) - 1/10*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*c*d^2*i^
3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 1
0*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1
/20*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*B^2*d^3*i^3*log(b*e*x/(d*
x + c) + a*e/(d*x + c))^2/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x
^3 + 10*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) - 1/9000*(60*((60*
```

```
b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b
*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2
 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2
 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x))/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b
^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*
b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10
*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6
*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 -
 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d
 + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 -
 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) +
60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3
*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^
6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2
*c*d^4 - a^5*b*d^5)*g^6))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (144*b^5*c
^5 - 1125*a*b^4*c^4*d + 4000*a^2*b^3*c^3*d^2 - 9000*a^3*b^2*c^2*d^3 + 18000
*a^4*b*c*d^4 - 12019*a^5*d^5 + 8220*(b^5*c*d^4 - a*b^4*d^5)*x^4 - 30*(77*b^
5*c^2*d^3 - 1250*a*b^4*c*d^4 + 1173*a^2*b^3*d^5)*x^3 + 10*(94*b^5*c^3*d^2 -
 975*a*b^4*c^2*d^3 + 6600*a^2*b^3*c*d^4 - 5719*a^3*b^2*d^5)*x^2 - 1800*(b^5
*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^
4*b*d^5*x + a^5*d^5)*log(b*x + a)^2 - 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 +
 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(d*x
 + c)^2 - 5*(81*b^5*c^4*d - 700*a*b^4*c^3*d^2 + 3000*a^2*b^3*c^2*d^3 - 1080
0*a^3*b^2*c*d^4 + 8419*a^4*b*d^5)*x + 8220*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 +
 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x
 + a) - 60*(137*b^5*d^5*x^5 + 685*a*b^4*d^5*x^4 + 1370*a^2*b^3*d^5*x^3 + 13
70*a^3*b^2*d^5*x^2 + 685*a^4*b*d^5*x + 137*a^5*d^5 - 60*(b^5*d^5*x^5 + 5*a*
b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5
*d^5)*log(b*x + a))*log(d*x + c))/(a^5*b^6*c^5*g^6 - 5*a^6*b^5*c^4*d*g^6 +
10*a^7*b^4*c^3*d^2*g^6 - 10*a^8*b^3*c^2*d^3*g^6 + 5*a^9*b^2*c*d^4*g^6 - a^1
0*b*d^5*g^6 + (b^11*c^5*g^6 - 5*a*b^10*c^4*d*g^6 + 10*a^2*b^9*c^3*d^2*g^6 -
 10*a^3*b^8*c^2*d^3*g^6 + 5*a^4*b^7*c*d^4*g^6 - a^5*b^6*d^5*g^6)*x^5 + 5*(a
*b^10*c^5*g^6 - 5*a^2*b^9*c^4*d*g^6 + 10*a^3*b^8*c^3*d^2*g^6 - 10*a^4*b^7*c
^2*d^3*g^6 + 5*a^5*b^6*c*d^4*g^6 - a^6*b^5*d^5*g^6)*x^4 + 10*(a^2*b^9*c^5*g
^6 - 5*a^3*b^8*c^4*d*g^6 + 10*a^4*b^7*c^3*d^2*g^6 - 10*a^5*b^6*c^2*d^3*g^6
 + 5*a^6*b^5*c*d^4*g^6 - a^7*b^4*d^5*g^6)*x^3 + 10*(a^3*b^8*c^5*g^6 - 5*a^4*
b^7*c^4*d*g^6 + 10*a^5*b^6*c^3*d^2*g^6 - 10*a^6*b^5*c^2*d^3*g^6 + 5*a^7*b^4
*c*d^4*g^6 - a^8*b^3*d^5*g^6)*x^2 + 5*(a^4*b^7*c^5*g^6 - 5*a^5*b^6*c^4*d*g^
6 + 10*a^6*b^5*c^3*d^2*g^6 - 10*a^7*b^4*c^2*d^3*g^6 + 5*a^8*b^3*c*d^4*g^6 -
 a^9*b^2*d^5*g^6)*x))*B^2*c^3*i^3 - 1/12000*(60*((27*a*b^4*c^4 - 148*a^2*b^
3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*
d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*
x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*
d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b
^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2
 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d
 + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9
*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)
*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^
5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b
^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^
5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b
*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2
 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4
 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*
a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6))*log(b*e*x/(d*x + c)
+ a*e/(d*x + c)) + (549*a*b^5*c^5 - 4625*a^2*b^4*c^4*d + 19000*a^3*b^3*c^3*
d^2 - 63000*a^4*b^2*c^2*d^3 + 51875*a^5*b*c*d^4 - 3799*a^6*d^5 - 60*(625*b^
6*c^2*d^3 - 702*a*b^5*c*d^4 + 77*a^2*b^4*d^5)*x^4 + 30*(325*b^6*c^3*d^2 - 5
```

667*a*b^5*c^2*d^3 + 5975*a^2*b^4*c*d^4 - 633*a^3*b^3*d^5)*x^3 - 10*(350*b^6
*c^4*d - 3949*a*b^5*c^3*d^2 + 29475*a^2*b^4*c^2*d^3 - 28775*a^3*b^3*c*d^4 +
2899*a^4*b^2*d^5)*x^2 + 1800*(5*a^5*b*c*d^4 - a^6*d^5 + (5*b^6*c*d^4 - a*b
^5*d^5)*x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^4*d^5)*x^4 + 10*(5*a^2*b^4*c*d^4 - a
^3*b^3*d^5)*x^3 + 10*(5*a^3*b^3*c*d^4 - a^4*b^2*d^5)*x^2 + 5*(5*a^4*b^2*c*d
^4 - a^5*b*d^5)*x)*log(b*x + a)^2 + 1800*(5*a^5*b*c*d^4 - a^6*d^5 + (5*b^6*
c*d^4 - a*b^5*d^5)*x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^4*d^5)*x^4 + 10*(5*a^2*b^
4*c*d^4 - a^3*b^3*d^5)*x^3 + 10*(5*a^3*b^3*c*d^4 - a^4*b^2*d^5)*x^2 + 5*(5*
a^4*b^2*c*d^4 - a^5*b*d^5)*x)*log(d*x + c)^2 + 5*(225*b^6*c^5 - 2201*a*b^5*
c^4*d + 10900*a^2*b^4*c^3*d^2 - 46200*a^3*b^3*c^2*d^3 + 41075*a^4*b^2*c*d^4
- 3799*a^5*b*d^5)*x - 60*(625*a^5*b*c*d^4 - 77*a^6*d^5 + (625*b^6*c*d^4 -
77*a*b^5*d^5)*x^5 + 5*(625*a*b^5*c*d^4 - 77*a^2*b^4*d^5)*x^4 + 10*(625*a^2*
b^4*c*d^4 - 77*a^3*b^3*d^5)*x^3 + 10*(625*a^3*b^3*c*d^4 - 77*a^4*b^2*d^5)*x
^2 + 5*(625*a^4*b^2*c*d^4 - 77*a^5*b*d^5)*x)*log(b*x + a) + 60*(625*a^5*b*c
*d^4 - 77*a^6*d^5 + (625*b^6*c*d^4 - 77*a*b^5*d^5)*x^5 + 5*(625*a*b^5*c*d^4
- 77*a^2*b^4*d^5)*x^4 + 10*(625*a^2*b^4*c*d^4 - 77*a^3*b^3*d^5)*x^3 + 10*(
625*a^3*b^3*c*d^4 - 77*a^4*b^2*d^5)*x^2 + 5*(625*a^4*b^2*c*d^4 - 77*a^5*b*d
^5)*x - 60*(5*a^5*b*c*d^4 - a^6*d^5 + (5*b^6*c*d^4 - a*b^5*d^5)*x^5 + 5*(5*
a*b^5*c*d^4 - a^2*b^4*d^5)*x^4 + 10*(5*a^2*b^4*c*d^4 - a^3*b^3*d^5)*x^3 + 1
0*(5*a^3*b^3*c*d^4 - a^4*b^2*d^5)*x^2 + 5*(5*a^4*b^2*c*d^4 - a^5*b*d^5)*x)*
log(b*x + a))*log(d*x + c))/(a^5*b^7*c^5*g^6 - 5*a^6*b^6*c^4*d*g^6 + 10*a^7
*b^5*c^3*d^2*g^6 - 10*a^8*b^4*c^2*d^3*g^6 + 5*a^9*b^3*c*d^4*g^6 - a^10*b^2*
d^5*g^6 + (b^12*c^5*g^6 - 5*a*b^11*c^4*d*g^6 + 10*a^2*b^10*c^3*d^2*g^6 - 10
*a^3*b^9*c^2*d^3*g^6 + 5*a^4*b^8*c*d^4*g^6 - a^5*b^7*d^5*g^6)*x^5 + 5*(a*b^
11*c^5*g^6 - 5*a^2*b^10*c^4*d*g^6 + 10*a^3*b^9*c^3*d^2*g^6 - 10*a^4*b^8*c^2
*d^3*g^6 + 5*a^5*b^7*c*d^4*g^6 - a^6*b^6*d^5*g^6)*x^4 + 10*(a^2*b^10*c^5*g^
6 - 5*a^3*b^9*c^4*d*g^6 + 10*a^4*b^8*c^3*d^2*g^6 - 10*a^5*b^7*c^2*d^3*g^6 +
5*a^6*b^6*c*d^4*g^6 - a^7*b^5*d^5*g^6)*x^3 + 10*(a^3*b^9*c^5*g^6 - 5*a^4*b
^8*c^4*d*g^6 + 10*a^5*b^7*c^3*d^2*g^6 - 10*a^6*b^6*c^2*d^3*g^6 + 5*a^7*b^5*
c*d^4*g^6 - a^8*b^4*d^5*g^6)*x^2 + 5*(a^4*b^8*c^5*g^6 - 5*a^5*b^7*c^4*d*g^6
+ 10*a^6*b^6*c^3*d^2*g^6 - 10*a^7*b^5*c^2*d^3*g^6 + 5*a^8*b^4*c*d^4*g^6 -
a^9*b^3*d^5*g^6)*x))*B^2*c^2*d*i^3 - 1/18000*(60*((47*a^2*b^4*c^4 - 278*a^3
*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^
6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*
c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^
5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5
*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^
3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a
^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*
a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4
- 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6
x^3 + 10(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*
d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c
^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^
3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*
c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 1
0*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6
) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*
a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a
^5*b^3*d^5)*g^6))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (1489*a^2*b^5*c^5
- 14375*a^3*b^4*c^4*d + 85000*a^4*b^3*c^3*d^2 - 85000*a^5*b^2*c^2*d^3 + 143
75*a^6*b*c*d^4 - 1489*a^7*d^5 + 60*(1100*b^7*c^3*d^2 - 1425*a*b^6*c^2*d^3 +
372*a^2*b^5*c*d^4 - 47*a^3*b^4*d^5)*x^4 - 30*(500*b^7*c^4*d - 9825*a*b^6*c
^3*d^2 + 11937*a^2*b^5*c^2*d^3 - 2975*a^3*b^4*c*d^4 + 363*a^4*b^3*d^5)*x^3
+ 10*(400*b^7*c^5 - 5450*a*b^6*c^4*d + 49189*a^2*b^5*c^3*d^2 - 55525*a^3*b^
4*c^2*d^3 + 12875*a^4*b^3*c*d^4 - 1489*a^5*b^2*d^5)*x^2 - 1800*(10*a^5*b^2*
c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b
^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10
*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*

```
c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^
5*b^2*c*d^4 + a^6*b*d^5)*x)*log(b*x + a)^2 - 1800*(10*a^5*b^2*c^2*d^3 - 5*a
^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 +
 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10*a^2*b^5*
c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*d^3 - 5*a
^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 +
 a^6*b*d^5)*x)*log(d*x + c)^2 + 5*(925*a*b^6*c^5 - 9911*a^2*b^5*c^4*d + 679
00*a^3*b^4*c^3*d^2 - 71800*a^4*b^3*c^2*d^3 + 14375*a^5*b^2*c*d^4 - 1489*a^6
*b*d^5)*x + 60*(1100*a^5*b^2*c^2*d^3 - 325*a^6*b*c*d^4 + 47*a^7*d^5 + (1100
*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x^5 + 5*(1100*a*b^6*c^2*d^
3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 + 10*(1100*a^2*b^5*c^2*d^3 - 32
5*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 - 325*a^4*
b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^4*b^3*c^2*d^3 - 325*a^5*b^2*c*d
^4 + 47*a^6*b*d^5)*x)*log(b*x + a) - 60*(1100*a^5*b^2*c^2*d^3 - 325*a^6*b*c
*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x
^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 + 10*(
1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 10*(1100*a
^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^4*b^3*
c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)*x - 60*(10*a^5*b^2*c^2*d^3 - 5*
a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5
+ 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10*a^2*b^5
*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*d^3 - 5*
a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^2*c*d^4
+ a^6*b*d^5)*x)*log(b*x + a))*log(d*x + c))/(a^5*b^8*c^5*g^6 - 5*a^6*b^7*c^
4*d*g^6 + 10*a^7*b^6*c^3*d^2*g^6 - 10*a^8*b^5*c^2*d^3*g^6 + 5*a^9*b^4*c*d^4
*g^6 - a^10*b^3*d^5*g^6 + (b^13*c^5*g^6 - 5*a*b^12*c^4*d*g^6 + 10*a^2*b^11*
c^3*d^2*g^6 - 10*a^3*b^10*c^2*d^3*g^6 + 5*a^4*b^9*c*d^4*g^6 - a^5*b^8*d^5*g
^6)*x^5 + 5*(a*b^12*c^5*g^6 - 5*a^2*b^11*c^4*d*g^6 + 10*a^3*b^10*c^3*d^2*g^
6 - 10*a^4*b^9*c^2*d^3*g^6 + 5*a^5*b^8*c*d^4*g^6 - a^6*b^7*d^5*g^6)*x^4 + 1
0*(a^2*b^11*c^5*g^6 - 5*a^3*b^10*c^4*d*g^6 + 10*a^4*b^9*c^3*d^2*g^6 - 10*a^
5*b^8*c^2*d^3*g^6 + 5*a^6*b^7*c*d^4*g^6 - a^7*b^6*d^5*g^6)*x^3 + 10*(a^3*b^
10*c^5*g^6 - 5*a^4*b^9*c^4*d*g^6 + 10*a^5*b^8*c^3*d^2*g^6 - 10*a^6*b^7*c^2*
d^3*g^6 + 5*a^7*b^6*c*d^4*g^6 - a^8*b^5*d^5*g^6)*x^2 + 5*(a^4*b^9*c^5*g^6 -
 5*a^5*b^8*c^4*d*g^6 + 10*a^6*b^7*c^3*d^2*g^6 - 10*a^7*b^6*c^2*d^3*g^6 + 5*
a^8*b^5*c*d^4*g^6 - a^9*b^4*d^5*g^6)*x))*B^2*c*d^2*i^3 - 1/36000*(60*((77*a
^3*b^4*c^4 - 548*a^4*b^3*c^3*d + 352*a^5*b^2*c^2*d^2 - 148*a^6*b*c*d^3 + 27
*a^7*d^4 - 60*(10*b^7*c^3*d - 10*a*b^6*c^2*d^2 + 5*a^2*b^5*c*d^3 - a^3*b^4*
d^4)*x^4 + 30*(10*b^7*c^4 - 100*a*b^6*c^3*d + 95*a^2*b^5*c^2*d^2 - 46*a^3*b
^4*c*d^3 + 9*a^4*b^3*d^4)*x^3 + 10*(50*a*b^6*c^4 - 410*a^2*b^5*c^3*d + 337*
a^3*b^4*c^2*d^2 - 148*a^4*b^3*c*d^3 + 27*a^5*b^2*d^4)*x^2 + 5*(65*a^2*b^5*c
^4 - 488*a^3*b^4*c^3*d + 352*a^4*b^3*c^2*d^2 - 148*a^5*b^2*c*d^3 + 27*a^6*b
*d^4)*x)/((b^13*c^4 - 4*a*b^12*c^3*d + 6*a^2*b^11*c^2*d^2 - 4*a^3*b^10*c*d^
3 + a^4*b^9*d^4)*g^6*x^5 + 5*(a*b^12*c^4 - 4*a^2*b^11*c^3*d + 6*a^3*b^10*c^
2*d^2 - 4*a^4*b^9*c*d^3 + a^5*b^8*d^4)*g^6*x^4 + 10*(a^2*b^11*c^4 - 4*a^3*b
^10*c^3*d + 6*a^4*b^9*c^2*d^2 - 4*a^5*b^8*c*d^3 + a^6*b^7*d^4)*g^6*x^3 + 10
*(a^3*b^10*c^4 - 4*a^4*b^9*c^3*d + 6*a^5*b^8*c^2*d^2 - 4*a^6*b^7*c*d^3 + a^
7*b^6*d^4)*g^6*x^2 + 5*(a^4*b^9*c^4 - 4*a^5*b^8*c^3*d + 6*a^6*b^7*c^2*d^2 -
 4*a^7*b^6*c*d^3 + a^8*b^5*d^4)*g^6*x + (a^5*b^8*c^4 - 4*a^6*b^7*c^3*d + 6*
a^7*b^6*c^2*d^2 - 4*a^8*b^5*c*d^3 + a^9*b^4*d^4)*g^6) - 60*(10*b^3*c^3*d^2
- 10*a*b^2*c^2*d^3 + 5*a^2*b*c*d^4 - a^3*d^5)*log(b*x + a)/((b^9*c^5 - 5*a*
b^8*c^4*d + 10*a^2*b^7*c^3*d^2 - 10*a^3*b^6*c^2*d^3 + 5*a^4*b^5*c*d^4 - a^5
*b^4*d^5)*g^6) + 60*(10*b^3*c^3*d^2 - 10*a*b^2*c^2*d^3 + 5*a^2*b*c*d^4 - a^
3*d^5)*log(d*x + c)/((b^9*c^5 - 5*a*b^8*c^4*d + 10*a^2*b^7*c^3*d^2 - 10*a^3
*b^6*c^2*d^3 + 5*a^4*b^5*c*d^4 - a^5*b^4*d^5)*g^6))*log(b*e*x/(d*x + c) + a
*e/(d*x + c)) + (3799*a^3*b^5*c^5 - 51875*a^4*b^4*c^4*d + 63000*a^5*b^3*c^3
*d^2 - 19000*a^6*b^2*c^2*d^3 + 4625*a^7*b*c*d^4 - 549*a^8*d^5 - 60*(900*b^8
*c^4*d - 1400*a*b^7*c^3*d^2 + 675*a^2*b^6*c^2*d^3 - 202*a^3*b^5*c*d^4 + 27*
a^4*b^4*d^5)*x^4 + 30*(300*b^8*c^5 - 7700*a*b^7*c^4*d + 11175*a^2*b^6*c^3*d
^2 - 5017*a^3*b^5*c^2*d^3 + 1425*a^4*b^4*c*d^4 - 183*a^5*b^3*d^5)*x^3 + 10*
```

(1900*a*b^7*c^5 - 33950*a^2*b^6*c^4*d + 45999*a^3*b^5*c^3*d^2 - 18025*a^4*b
^4*c^2*d^3 + 4625*a^5*b^3*c*d^4 - 549*a^6*b^2*d^5)*x^2 + 1800*(10*a^5*b^3*c
^3*d^2 - 10*a^6*b^2*c^2*d^3 + 5*a^7*b*c*d^4 - a^8*d^5 + (10*b^8*c^3*d^2 - 1
0*a*b^7*c^2*d^3 + 5*a^2*b^6*c*d^4 - a^3*b^5*d^5)*x^5 + 5*(10*a*b^7*c^3*d^2
- 10*a^2*b^6*c^2*d^3 + 5*a^3*b^5*c*d^4 - a^4*b^4*d^5)*x^4 + 10*(10*a^2*b^6*
c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*x^3 + 10*(10*
a^3*b^5*c^3*d^2 - 10*a^4*b^4*c^2*d^3 + 5*a^5*b^3*c*d^4 - a^6*b^2*d^5)*x^2 +
5*(10*a^4*b^4*c^3*d^2 - 10*a^5*b^3*c^2*d^3 + 5*a^6*b^2*c*d^4 - a^7*b*d^5)*
x)*log(b*x + a)^2 + 1800*(10*a^5*b^3*c^3*d^2 - 10*a^6*b^2*c^2*d^3 + 5*a^7*b
*c*d^4 - a^8*d^5 + (10*b^8*c^3*d^2 - 10*a*b^7*c^2*d^3 + 5*a^2*b^6*c*d^4 - a
^3*b^5*d^5)*x^5 + 5*(10*a*b^7*c^3*d^2 - 10*a^2*b^6*c^2*d^3 + 5*a^3*b^5*c*d^
4 - a^4*b^4*d^5)*x^4 + 10*(10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*
b^4*c*d^4 - a^5*b^3*d^5)*x^3 + 10*(10*a^3*b^5*c^3*d^2 - 10*a^4*b^4*c^2*d^3
+ 5*a^5*b^3*c*d^4 - a^6*b^2*d^5)*x^2 + 5*(10*a^4*b^4*c^3*d^2 - 10*a^5*b^3*c
^2*d^3 + 5*a^6*b^2*c*d^4 - a^7*b*d^5)*x)*log(d*x + c)^2 + 5*(2875*a^2*b^6*c
^5 - 43451*a^3*b^5*c^4*d + 55500*a^4*b^4*c^3*d^2 - 19000*a^5*b^3*c^2*d^3 +
4625*a^6*b^2*c*d^4 - 549*a^7*b*d^5)*x - 60*(900*a^5*b^3*c^3*d^2 - 500*a^6*b
^2*c^2*d^3 + 175*a^7*b*c*d^4 - 27*a^8*d^5 + (900*b^8*c^3*d^2 - 500*a*b^7*c^
2*d^3 + 175*a^2*b^6*c*d^4 - 27*a^3*b^5*d^5)*x^5 + 5*(900*a*b^7*c^3*d^2 - 50
0*a^2*b^6*c^2*d^3 + 175*a^3*b^5*c*d^4 - 27*a^4*b^4*d^5)*x^4 + 10*(900*a^2*b
^6*c^3*d^2 - 500*a^3*b^5*c^2*d^3 + 175*a^4*b^4*c*d^4 - 27*a^5*b^3*d^5)*x^3
+ 10*(900*a^3*b^5*c^3*d^2 - 500*a^4*b^4*c^2*d^3 + 175*a^5*b^3*c*d^4 - 27*a^
6*b^2*d^5)*x^2 + 5*(900*a^4*b^4*c^3*d^2 - 500*a^5*b^3*c^2*d^3 + 175*a^6*b^2
*c*d^4 - 27*a^7*b*d^5)*x)*log(b*x + a) + 60*(900*a^5*b^3*c^3*d^2 - 500*a^6*
b^2*c^2*d^3 + 175*a^7*b*c*d^4 - 27*a^8*d^5 + (900*b^8*c^3*d^2 - 500*a*b^7*c
^2*d^3 + 175*a^2*b^6*c*d^4 - 27*a^3*b^5*d^5)*x^5 + 5*(900*a*b^7*c^3*d^2 - 5
00*a^2*b^6*c^2*d^3 + 175*a^3*b^5*c*d^4 - 27*a^4*b^4*d^5)*x^4 + 10*(900*a^2*
b^6*c^3*d^2 - 500*a^3*b^5*c^2*d^3 + 175*a^4*b^4*c*d^4 - 27*a^5*b^3*d^5)*x^3
+ 10*(900*a^3*b^5*c^3*d^2 - 500*a^4*b^4*c^2*d^3 + 175*a^5*b^3*c*d^4 - 27*a
^6*b^2*d^5)*x^2 + 5*(900*a^4*b^4*c^3*d^2 - 500*a^5*b^3*c^2*d^3 + 175*a^6*b^
2*c*d^4 - 27*a^7*b*d^5)*x - 60*(10*a^5*b^3*c^3*d^2 - 10*a^6*b^2*c^2*d^3 + 5
*a^7*b*c*d^4 - a^8*d^5 + (10*b^8*c^3*d^2 - 10*a*b^7*c^2*d^3 + 5*a^2*b^6*c*d
^4 - a^3*b^5*d^5)*x^5 + 5*(10*a*b^7*c^3*d^2 - 10*a^2*b^6*c^2*d^3 + 5*a^3*b^
5*c*d^4 - a^4*b^4*d^5)*x^4 + 10*(10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 +
5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*x^3 + 10*(10*a^3*b^5*c^3*d^2 - 10*a^4*b^4*c^
2*d^3 + 5*a^5*b^3*c*d^4 - a^6*b^2*d^5)*x^2 + 5*(10*a^4*b^4*c^3*d^2 - 10*a^5
*b^3*c^2*d^3 + 5*a^6*b^2*c*d^4 - a^7*b*d^5)*x)*log(b*x + a))*log(d*x + c))/
(a^5*b^9*c^5*g^6 - 5*a^6*b^8*c^4*d*g^6 + 10*a^7*b^7*c^3*d^2*g^6 - 10*a^8*b^
6*c^2*d^3*g^6 + 5*a^9*b^5*c*d^4*g^6 - a^10*b^4*d^5*g^6 + (b^14*c^5*g^6 - 5*
a*b^13*c^4*d*g^6 + 10*a^2*b^12*c^3*d^2*g^6 - 10*a^3*b^11*c^2*d^3*g^6 + 5*a^
4*b^10*c*d^4*g^6 - a^5*b^9*d^5*g^6)*x^5 + 5*(a*b^13*c^5*g^6 - 5*a^2*b^12*c^
4*d*g^6 + 10*a^3*b^11*c^3*d^2*g^6 - 10*a^4*b^10*c^2*d^3*g^6 + 5*a^5*b^9*c*d
^4*g^6 - a^6*b^8*d^5*g^6)*x^4 + 10*(a^2*b^12*c^5*g^6 - 5*a^3*b^11*c^4*d*g^6
+ 10*a^4*b^10*c^3*d^2*g^6 - 10*a^5*b^9*c^2*d^3*g^6 + 5*a^6*b^8*c*d^4*g^6 -
a^7*b^7*d^5*g^6)*x^3 + 10*(a^3*b^11*c^5*g^6 - 5*a^4*b^10*c^4*d*g^6 + 10*a^
5*b^9*c^3*d^2*g^6 - 10*a^6*b^8*c^2*d^3*g^6 + 5*a^7*b^7*c*d^4*g^6 - a^8*b^6*
d^5*g^6)*x^2 + 5*(a^4*b^10*c^5*g^6 - 5*a^5*b^9*c^4*d*g^6 + 10*a^6*b^8*c^3*d
^2*g^6 - 10*a^7*b^7*c^2*d^3*g^6 + 5*a^8*b^6*c*d^4*g^6 - a^9*b^5*d^5*g^6)*x)
)*B^2*d^3*i^3 - 1/600*A*B*d^3*i^3*(60*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*
x + a^3)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^
4 + 10*a^2*b^7*g^6*x^3 + 10*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6
) + (77*a^3*b^4*c^4 - 548*a^4*b^3*c^3*d + 352*a^5*b^2*c^2*d^2 - 148*a^6*b*c
*d^3 + 27*a^7*d^4 - 60*(10*b^7*c^3*d - 10*a*b^6*c^2*d^2 + 5*a^2*b^5*c*d^3 -
a^3*b^4*d^4)*x^4 + 30*(10*b^7*c^4 - 100*a*b^6*c^3*d + 95*a^2*b^5*c^2*d^2 -
46*a^3*b^4*c*d^3 + 9*a^4*b^3*d^4)*x^3 + 10*(50*a*b^6*c^4 - 410*a^2*b^5*c^3
*d + 337*a^3*b^4*c^2*d^2 - 148*a^4*b^3*c*d^3 + 27*a^5*b^2*d^4)*x^2 + 5*(65*
a^2*b^5*c^4 - 488*a^3*b^4*c^3*d + 352*a^4*b^3*c^2*d^2 - 148*a^5*b^2*c*d^3 +
27*a^6*b*d^4)*x)/((b^13*c^4 - 4*a*b^12*c^3*d + 6*a^2*b^11*c^2*d^2 - 4*a^3*
b^10*c*d^3 + a^4*b^9*d^4)*g^6*x^5 + 5*(a*b^12*c^4 - 4*a^2*b^11*c^3*d + 6*a^

3*b^10*c^2*d^2 - 4*a^4*b^9*c*d^3 + a^5*b^8*d^4)*g^6*x^4 + 10*(a^2*b^11*c^4 - 4*a^3*b^10*c^3*d + 6*a^4*b^9*c^2*d^2 - 4*a^5*b^8*c*d^3 + a^6*b^7*d^4)*g^6 *x^3 + 10*(a^3*b^10*c^4 - 4*a^4*b^9*c^3*d + 6*a^5*b^8*c^2*d^2 - 4*a^6*b^7*c *d^3 + a^7*b^6*d^4)*g^6*x^2 + 5*(a^4*b^9*c^4 - 4*a^5*b^8*c^3*d + 6*a^6*b^7* c^2*d^2 - 4*a^7*b^6*c*d^3 + a^8*b^5*d^4)*g^6*x + (a^5*b^8*c^4 - 4*a^6*b^7*c ^3*d + 6*a^7*b^6*c^2*d^2 - 4*a^8*b^5*c*d^3 + a^9*b^4*d^4)*g^6) - 60*(10*b^3 *c^3*d^2 - 10*a*b^2*c^2*d^3 + 5*a^2*b*c*d^4 - a^3*d^5)*log(b*x + a)/((b^9*c ^5 - 5*a*b^8*c^4*d + 10*a^2*b^7*c^3*d^2 - 10*a^3*b^6*c^2*d^3 + 5*a^4*b^5*c* d^4 - a^5*b^4*d^5)*g^6) + 60*(10*b^3*c^3*d^2 - 10*a*b^2*c^2*d^3 + 5*a^2*b*c *d^4 - a^3*d^5)*log(d*x + c)/((b^9*c^5 - 5*a*b^8*c^4*d + 10*a^2*b^7*c^3*d^2 - 10*a^3*b^6*c^2*d^3 + 5*a^4*b^5*c*d^4 - a^5*b^4*d^5)*g^6)) - 1/300*A*B*c* d^2*i^3*(60*(10*b^2*x^2 + 5*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + (47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 8 22*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5* a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a ^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537* a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d ^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^ 2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c ^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3 *b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5* d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7 *b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^ 5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a* b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3* d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2 *c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^ 6)) - 1/200*A*B*c^2*d*i^3*(60*(5*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^ 2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) + (27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 35 2*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4* d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10 *b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5 *(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 7 7*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8 *c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8 *c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3 *b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 1 0*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^ 7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6* a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d ^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^ 4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*lo g(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2* d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) - 1/150*A*B*c^3*i^3*((60*b^4*d^4 *x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a *b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a ^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2* d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3 *d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b ^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^ 4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6* b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6

```
*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*
b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*log(
b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^
4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6) + 60*d^5*log(
b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^
3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a
*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^
5*b*d^5)*g^6)) - 1/5*B^2*c^3*i^3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^
6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a
^4*b^2*g^6*x + a^5*b*g^6) - 3/20*(5*b*x + a)*A^2*c^2*d*i^3/(b^7*g^6*x^5 + 5
*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x
+ a^5*b^2*g^6) - 1/10*(10*b^2*x^2 + 5*a*b*x + a^2)*A^2*c*d^2*i^3/(b^8*g^6*x
^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*
g^6*x + a^5*b^3*g^6) - 1/20*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*A
^2*d^3*i^3/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x^3 + 10*a^3*b^6
*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) - 1/5*A^2*c^3*i^3/(b^6*g^6*x^5 +
5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x
 + a^5*b*g^6)
```

Fricas [B] time = 0.623722, size = 2209, normalized size = 7.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="fricas")
```

```
[Out] 1/4000*(20*((20*A*B + 9*B^2)*b^5*c*d^4 - (20*A*B + 9*B^2)*a*b^4*d^5)*i^3*x^
4 - 10*((200*A^2 + 20*A*B - 11*B^2)*b^5*c^2*d^3 - 50*(8*A^2 + 4*A*B + B^2)*
a*b^4*c*d^4 + (200*A^2 + 180*A*B + 61*B^2)*a^2*b^3*d^5)*i^3*x^3 - 10*(2*(20
0*A^2 + 60*A*B + 7*B^2)*b^5*c^3*d^2 - 75*(8*A^2 + 4*A*B + B^2)*a*b^4*c^2*d^
3 + (200*A^2 + 180*A*B + 61*B^2)*a^3*b^2*d^5)*i^3*x^2 - 5*((600*A^2 + 220*A
*B + 39*B^2)*b^5*c^4*d - 100*(8*A^2 + 4*A*B + B^2)*a*b^4*c^3*d^2 + (200*A^2
 + 180*A*B + 61*B^2)*a^4*b*d^5)*i^3*x - (32*(25*A^2 + 10*A*B + 2*B^2)*b^5*c
^5 - 125*(8*A^2 + 4*A*B + B^2)*a*b^4*c^4*d + (200*A^2 + 180*A*B + 61*B^2)*a
^5*d^5)*i^3 + 200*(B^2*b^5*d^5*i^3*x^5 + 5*B^2*a*b^4*d^5*i^3*x^4 - 10*(B^2*
b^5*c^2*d^3 - 2*B^2*a*b^4*c*d^4)*i^3*x^3 - 10*(2*B^2*b^5*c^3*d^2 - 3*B^2*a*
b^4*c^2*d^3)*i^3*x^2 - 5*(3*B^2*b^5*c^4*d - 4*B^2*a*b^4*c^3*d^2)*i^3*x - (4
*B^2*b^5*c^5 - 5*B^2*a*b^4*c^4*d)*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 20*
((20*A*B + 9*B^2)*b^5*d^5*i^3*x^5 + 5*(4*B^2*b^5*c*d^4 + 5*(4*A*B + B^2)*a*
b^4*d^5)*i^3*x^4 - 10*((20*A*B + B^2)*b^5*c^2*d^3 - 10*(4*A*B + B^2)*a*b^4*
c*d^4)*i^3*x^3 - 10*(2*(20*A*B + 3*B^2)*b^5*c^3*d^2 - 15*(4*A*B + B^2)*a*b^
4*c^2*d^3)*i^3*x^2 - 5*((60*A*B + 11*B^2)*b^5*c^4*d - 20*(4*A*B + B^2)*a*b^
4*c^3*d^2)*i^3*x - (16*(5*A*B + B^2)*b^5*c^5 - 25*(4*A*B + B^2)*a*b^4*c^4*d
)*i^3)*log((b*e*x + a*e)/(d*x + c)))/((b^11*c^2 - 2*a*b^10*c*d + a^2*b^9*d^
2)*g^6*x^5 + 5*(a*b^10*c^2 - 2*a^2*b^9*c*d + a^3*b^8*d^2)*g^6*x^4 + 10*(a^2
*b^9*c^2 - 2*a^3*b^8*c*d + a^4*b^7*d^2)*g^6*x^3 + 10*(a^3*b^8*c^2 - 2*a^4*b
^7*c*d + a^5*b^6*d^2)*g^6*x^2 + 5*(a^4*b^7*c^2 - 2*a^5*b^6*c*d + a^6*b^5*d^
2)*g^6*x + (a^5*b^6*c^2 - 2*a^6*b^5*c*d + a^7*b^4*d^2)*g^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^6, x)
```

3.83 $\int \frac{(ci+dix)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^7}\,dx$

Optimal. Leaf size=463

$$-\frac{b^2 i^3 (c+dx)^6 \left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{6g^7(a+bx)^6(bc-ad)^3}-\frac{b^2 B i^3 (c+dx)^6 \left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{18g^7(a+bx)^6(bc-ad)^3}-\frac{d^2 i^3 (c+dx)^4 \left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^7(a+bx)^4(bc-ad)^3}-$$

```
[Out] -(B^2*d^2*i^3*(c + d*x)^4)/(32*(b*c - a*d)^3*g^7*(a + b*x)^4) + (4*b*B^2*d*
i^3*(c + d*x)^5)/(125*(b*c - a*d)^3*g^7*(a + b*x)^5) - (b^2*B^2*i^3*(c + d*
x)^6)/(108*(b*c - a*d)^3*g^7*(a + b*x)^6) - (B*d^2*i^3*(c + d*x)^4*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)^3*g^7*(a + b*x)^4) + (4*b*B*d*
i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(25*(b*c - a*d)^3*g^7
*(a + b*x)^5) - (b^2*B*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(18*(b*c - a*d)^3*g^7*(a + b*x)^6) - (d^2*i^3*(c + d*x)^4*(A + B*Log[(e*(
a + b*x))/(c + d*x)])^2)/(4*(b*c - a*d)^3*g^7*(a + b*x)^4) + (2*b*d*i^3*(c
+ d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*(b*c - a*d)^3*g^7*(a +
b*x)^5) - (b^2*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*(
b*c - a*d)^3*g^7*(a + b*x)^6)
```

Rubi [C] time = 6.0774, antiderivative size = 1152, normalized size of antiderivative = 2.49, number of steps used = 162, number of rules used = 11, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.262, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 i^3 \log^2(a+bx) d^6}{60b^4(bc-ad)^3g^7}+\frac{B^2 i^3 \log^2(c+dx) d^6}{60b^4(bc-ad)^3g^7}-\frac{37B^2 i^3 \log(a+bx) d^6}{1800b^4(bc-ad)^3g^7}-\frac{B i^3 \log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) d^6}{30b^4(bc-ad)^3g^7}+$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^
7,x]
```

```
[Out] -(B^2*(b*c - a*d)^3*i^3)/(108*b^4*g^7*(a + b*x)^6) - (53*B^2*d*(b*c - a*d)^
2*i^3)/(2250*b^4*g^7*(a + b*x)^5) - (73*B^2*d^2*(b*c - a*d)*i^3)/(7200*b^4*
g^7*(a + b*x)^4) + (53*B^2*d^3*i^3)/(5400*b^4*g^7*(a + b*x)^3) - (23*B^2*d^
4*i^3)/(3600*b^4*(b*c - a*d)*g^7*(a + b*x)^2) - (37*B^2*d^5*i^3)/(1800*b^4*
(b*c - a*d)^2*g^7*(a + b*x)) - (37*B^2*d^6*i^3*Log[a + b*x])/(1800*b^4*(b*c
 - a*d)^3*g^7) + (B^2*d^6*i^3*Log[a + b*x]^2)/(60*b^4*(b*c - a*d)^3*g^7) -
(B*(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(18*b^4*g^7*(a +
 b*x)^6) - (13*B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(75*b^4*g^7*(a + b*x)^5) - (19*B*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(120*b^4*g^7*(a + b*x)^4) - (B*d^3*i^3*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(90*b^4*g^7*(a + b*x)^3) + (B*d^4*i^3*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(60*b^4*(b*c - a*d)*g^7*(a + b*x)^2) - (B*d^5*i^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^4*(b*c - a*d)^2*g^7*(a + b*x)) - (B*d
^6*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^4*(b*c - a*
d)^3*g^7) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(6*b
^4*g^7*(a + b*x)^6) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c +
d*x)])^2)/(5*b^4*g^7*(a + b*x)^5) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/(4*b^4*g^7*(a + b*x)^4) - (d^3*i^3*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/(3*b^4*g^7*(a + b*x)^3) + (37*B^2*d^6*i^3*Log[c + d
*x])/(1800*b^4*(b*c - a*d)^3*g^7) - (B^2*d^6*i^3*Log[-((d*(a + b*x))/(b*c -
 a*d))]*Log[c + d*x])/(30*b^4*(b*c - a*d)^3*g^7) + (B*d^6*i^3*(A + B*Log[(e
```

```
*(a + b*x))/(c + d*x)])*Log[c + d*x])/(30*b^4*(b*c - a*d)^3*g^7) + (B^2*d^6
*i^3*Log[c + d*x]^2)/(60*b^4*(b*c - a*d)^3*g^7) - (B^2*d^6*i^3*Log[a + b*x]
*Log[(b*(c + d*x))/(b*c - a*d)])/(30*b^4*(b*c - a*d)^3*g^7) - (B^2*d^6*i^3*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(30*b^4*(b*c - a*d)^3*g^7) - (B^2
*d^6*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(30*b^4*(b*c - a*d)^3*g^7)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(83c+83dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^7}\,dx = \int \left(\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{b^3g^7(a+bx)^7} + \frac{1715361d(bc-ad)^2\left(A+B\log\right.}{b^3g^7(a+bx)^6}\right.$$

$$= \frac{\left(571787d^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^4}\,dx}{b^3g^7} + \frac{\left(1715361d^2(bc-ad)\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{(a+bx)^5}}{b^3g^7}$$

$$= -\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6} - \frac{1715361d(bc-ad)^2\left(A+B\log\right.}{5b^4g^7(a+bx)^5}$$

$$= -\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6} - \frac{1715361d(bc-ad)^2\left(A+B\log\right.}{5b^4g^7(a+bx)^5}$$

$$= -\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6} - \frac{1715361d(bc-ad)^2\left(A+B\log\right.}{5b^4g^7(a+bx)^5}$$

$$= -\frac{571787(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{6b^4g^7(a+bx)^6} - \frac{1715361d(bc-ad)^2\left(A+B\log\right.}{5b^4g^7(a+bx)^5}$$

$$= -\frac{571787B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{18b^4g^7(a+bx)^6} - \frac{7433231Bd(bc-ad)^2\left(A+B\,l\right.}{75b^4g^7(a+bx)^5}$$

$$= -\frac{571787B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{18b^4g^7(a+bx)^6} - \frac{7433231Bd(bc-ad)^2\left(A+B\,l\right.}{75b^4g^7(a+bx)^5}$$

$$= -\frac{571787B(bc-ad)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{18b^4g^7(a+bx)^6} - \frac{7433231Bd(bc-ad)^2\left(A+B\,l\right.}{75b^4g^7(a+bx)^5}$$

$$= -\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6} - \frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5} - \frac{41740451B^2d^2(bc-ad)}{7200b^4g^7(a+bx)^4}$$

$$= -\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6} - \frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5} - \frac{41740451B^2d^2(bc-ad)}{7200b^4g^7(a+bx)^4}$$

$$= -\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6} - \frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5} - \frac{41740451B^2d^2(bc-ad)}{7200b^4g^7(a+bx)^4}$$

$$= -\frac{571787B^2(bc-ad)^3}{108b^4g^7(a+bx)^6} - \frac{30304711B^2d(bc-ad)^2}{2250b^4g^7(a+bx)^5} - \frac{41740451B^2d^2(bc-ad)}{7200b^4g^7(a+bx)^4}$$

Mathematica [C] time = 5.9321, size = 2583, normalized size = 5.58

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^7,x]
```

```
[Out] (i^3*(8100*a^2*B^2*d^2*(b*c - a*d)^4 - 1000*B^2*(b*c - a*d)^6 + 3744*a*B^2*
d*(-(b*c) + a*d)^5 + 16200*a*b*B^2*d^2*(b*c - a*d)^4*x - 3744*b*B^2*d*(b*c
```

- a*d)^5*x + 8100*b^2*B^2*d^2*(b*c - a*d)^4*x^2 + 4680*a*B^2*d^2*(b*c - a*d
)^4*(a + b*x) + 1200*B^2*d*(b*c - a*d)^5*(a + b*x) + 10800*a^2*B^2*d^3*(-(b
*c) + a*d)^3*(a + b*x) + 4680*b*B^2*d^2*(b*c - a*d)^4*x*(a + b*x) + 21600*a
*b*B^2*d^3*(-(b*c) + a*d)^3*x*(a + b*x) - 10800*b^2*B^2*d^3*(b*c - a*d)^3*x
^2*(a + b*x) + 16200*a^2*B^2*d^4*(b*c - a*d)^2*(a + b*x)^2 - 13875*B^2*d^2*
(b*c - a*d)^4*(a + b*x)^2 + 20640*a*B^2*d^3*(-(b*c) + a*d)^3*(a + b*x)^2 +
32400*a*b*B^2*d^4*(b*c - a*d)^2*x*(a + b*x)^2 - 20640*b*B^2*d^3*(b*c - a*d)
^3*x*(a + b*x)^2 + 16200*b^2*B^2*d^4*(b*c - a*d)^2*x^2*(a + b*x)^2 + 63360*
a*B^2*d^4*(b*c - a*d)^2*(a + b*x)^3 + 32500*B^2*d^3*(b*c - a*d)^3*(a + b*x)
^3 + 32400*a^2*B^2*d^5*(-(b*c) + a*d)*(a + b*x)^3 + 63360*b*B^2*d^4*(b*c -
a*d)^2*x*(a + b*x)^3 + 64800*a*b*B^2*d^5*(-(b*c) + a*d)*x*(a + b*x)^3 - 324
00*b^2*B^2*d^5*(b*c - a*d)*x^2*(a + b*x)^3 - 129600*a*b*B^2*c*d^5*(a + b*x)
^4 + 129600*a^2*B^2*d^6*(a + b*x)^4 - 80250*B^2*d^4*(b*c - a*d)^2*(a + b*x)
^4 + 126720*a*B^2*d^5*(-(b*c) + a*d)*(a + b*x)^4 - 129600*b^2*B^2*c*d^5*x*(
a + b*x)^4 + 129600*a*b*B^2*d^6*x*(a + b*x)^4 - 126720*b*B^2*d^5*(b*c - a*d
)*x*(a + b*x)^4 + 126000*b*B^2*c*d^5*(a + b*x)^5 - 126000*a*B^2*d^6*(a + b*
x)^5 + 160500*B^2*d^5*(b*c - a*d)*(a + b*x)^5 - 32400*a^2*B^2*d^6*(a + b*x)
^4*Log[a + b*x] - 64800*a*b*B^2*d^6*x*(a + b*x)^4*Log[a + b*x] - 32400*b^2*
B^2*d^6*x^2*(a + b*x)^4*Log[a + b*x] - 256320*a*B^2*d^6*(a + b*x)^5*Log[a +
 b*x] - 256320*b*B^2*d^6*x*(a + b*x)^5*Log[a + b*x] + 286500*B^2*d^6*(a + b
*x)^6*Log[a + b*x] - 6000*B*(b*c - a*d)^6*(A + B*Log[(e*(a + b*x))/(c + d*x
)]) + 25920*a*B*d*(-(b*c) + a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2
5920*b*B*d*(b*c - a*d)^5*x*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 32400*a*B
d^2(b*c - a*d)^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 7200*B*
d*(b*c - a*d)^5*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 32400*b*B*
d^2*(b*c - a*d)^4*x*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 49500*
B*d^2*(b*c - a*d)^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4320
0*a*B*d^3*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
 - 43200*b*B*d^3*(b*c - a*d)^3*x*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c +
d*x)]) + 64800*a*B*d^4*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)]) + 42000*B*d^3*(b*c - a*d)^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)]) + 64800*b*B*d^4*(b*c - a*d)^2*x*(a + b*x)^3*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) - 63000*B*d^4*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]) + 129600*a*B*d^5*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) - 129600*b*B*d^5*(b*c - a*d)*x*(a + b*x)^4*(A +
B*Log[(e*(a + b*x))/(c + d*x)]) + 126000*B*d^5*(b*c - a*d)*(a + b*x)^5*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]) - 129600*a*B*d^6*(a + b*x)^5*Log[a + b*x]*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 129600*b*B*d^6*x*(a + b*x)^5*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 126000*B*d^6*(a + b*x)^6*Log[a
 + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18000*(b*c - a*d)^6*(A + B*L
og[(e*(a + b*x))/(c + d*x)])^2 + 64800*d*(-(b*c) + a*d)^5*(a + b*x)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])^2 - 81000*d^2*(b*c - a*d)^4*(a + b*x)^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2 + 36000*d^3*(-(b*c) + a*d)^3*(a + b*x)^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 32400*a^2*B^2*d^6*(a + b*x)^4*Log[
c + d*x] + 64800*a*b*B^2*d^6*x*(a + b*x)^4*Log[c + d*x] + 32400*b^2*B^2*d^6
x^2(a + b*x)^4*Log[c + d*x] + 256320*a*B^2*d^6*(a + b*x)^5*Log[c + d*x] +
 256320*b*B^2*d^6*x*(a + b*x)^5*Log[c + d*x] - 286500*B^2*d^6*(a + b*x)^6*L
og[c + d*x] + 129600*a*B*d^6*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)
])*Log[c + d*x] + 129600*b*B*d^6*x*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])*Log[c + d*x] - 126000*B*d^6*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x] + 64800*a*B^2*d^6*(a + b*x)^5*(Log[a + b*x]*(Log[a
+ b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(
b*c) + a*d)]) + 64800*b*B^2*d^6*x*(a + b*x)^5*(Log[a + b*x]*(Log[a + b*x] -
 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)]) - 63000*B^2*d^6*(a + b*x)^6*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 6480
0*a*B^2*d^6*(a + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x
])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 64800*b*B^2*d^
6*x*(a + b*x)^5*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c

```
 + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 63000*B^2*d^6*(a + b*x
)^6*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(108000*b^4*(b*c - a*d)^3*g^7*(a +
 b*x)^6)
```

Maple [B] time = 0.053, size = 2762, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x)
```

```
[Out] 1/18*e^6*d*i^3/(a*d-b*c)^4/g^7*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^
6*a-1/3*e^6*i^3/(a*d-b*c)^4/g^7*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/4*e^4*d^2*i^3/(a*d-b*c)^4/g^7*B^2/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1
/18*e^6*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/8*e^4*d^2*i^3/(a*d-b*c)^4/g^7*B^2/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/2*e
^4*d^3*i^3/(a*d-b*c)^4/g^7*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*a-2/5*e^5*d^2*i^3/(a*d-b*c)^4/g^7*B^2*b/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2/5*e^5*d*
i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2*c+4/25*e^5*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/6*e^6*d*i^
3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2*a-1/8*e^4*d^2*i^3/(a*d-b*c)^4/g^7*A*B/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^4*b*c-4/25*e^5*d^2*i^3/(a*d-b*c)^4/g^7*A*B*b/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+4/25*e^5*d*i^3/(a*d-b*c)^4/g^7*A*B*b^2/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c-4/25*e^5*d^2*i^3/(a*d-b*c)^4/g^7*B^2*b/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4/1
25*e^5*d^2*i^3/(a*d-b*c)^4/g^7*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*
a+4/125*e^5*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^5*c+1/108*e^6*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)^6*a-1/18*e^6*i^3/(a*d-b*c)^4/g^7*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/4*e^4*d^3*i^3/(a*d-b*c)^4/g
^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^2*a+1/8*e^4*d^3*i^3/(a*d-b*c)^4/g^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/6*e^6*i^3/(a*d-b*c)^4/g^7*B^2*b^3/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+1
/4*e^4*d^3*i^3/(a*d-b*c)^4/g^7*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+
1/6*e^6*d*i^3/(a*d-b*c)^4/g^7*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6
*a+1/8*e^4*d^3*i^3/(a*d-b*c)^4/g^7*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^
4*a-1/32*e^4*d^2*i^3/(a*d-b*c)^4/g^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c
)^4*b*c+1/32*e^4*d^3*i^3/(a*d-b*c)^4/g^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^4*a-1/6*e^6*i^3/(a*d-b*c)^4/g^7*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^6*c-1/108*e^6*i^3/(a*d-b*c)^4/g^7*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^6*c+1/3*e^6*d*i^3/(a*d-b*c)^4/g^7*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/
(d*x+c)*b*c)^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^4*d^2*i^3/(a*d-b*c)^
4/g^7*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))*b*c-4/5*e^5*d^2*i^3/(a*d-b*c)^4/g^7*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4/5*e^5*d*i^3/(a*d-b*c)^4/g^7*A
*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*c-1/18*e^6*i^3/(a*d-b*c)^4/g^7*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c
)^6*c-1/4*e^4*d^2*i^3/(a*d-b*c)^4/g^7*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^4*b*c-2/5*e^5*d^2*i^3/(a*d-b*c)^4/g^7*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
```

```
c)*b*c)^5*a+2/5*e^5*d*i^3/(a*d-b*c)^4/g^7*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d
*x+c)*b*c)^5*c
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x, alg
orithm="maxima")
```

```
[Out] Timed out
```

Fricas [B] time = 0.703528, size = 3443, normalized size = 7.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x, alg
orithm="fricas")
```

```
[Out] -1/108000*(60*((60*A*B + 37*B^2)*b^6*c*d^5 - (60*A*B + 37*B^2)*a*b^5*d^6)*i
^3*x^5 - 30*((60*A*B - 23*B^2)*b^6*c^2*d^4 - 36*(20*A*B + 9*B^2)*a*b^5*c*d^
5 + (660*A*B + 347*B^2)*a^2*b^4*d^6)*i^3*x^4 + 20*((1800*A^2 + 60*A*B - 53*
B^2)*b^6*c^3*d^3 - 27*(200*A^2 + 20*A*B - 11*B^2)*a*b^5*c^2*d^4 + 675*(8*A^
2 + 4*A*B + B^2)*a^2*b^4*c*d^5 - (1800*A^2 + 2220*A*B + 919*B^2)*a^3*b^3*d^
6)*i^3*x^3 + 15*((5400*A^2 + 1140*A*B + 73*B^2)*b^6*c^4*d^2 - 72*(200*A^2 +
 60*A*B + 7*B^2)*a*b^5*c^3*d^3 + 1350*(8*A^2 + 4*A*B + B^2)*a^2*b^4*c^2*d^4
 - (1800*A^2 + 2220*A*B + 919*B^2)*a^4*b^2*d^6)*i^3*x^2 + 6*(8*(1350*A^2 +
390*A*B + 53*B^2)*b^6*c^5*d - 45*(600*A^2 + 220*A*B + 39*B^2)*a*b^5*c^4*d^2
 + 2250*(8*A^2 + 4*A*B + B^2)*a^2*b^4*c^3*d^3 - (1800*A^2 + 2220*A*B + 919*
B^2)*a^5*b*d^6)*i^3*x + (1000*(18*A^2 + 6*A*B + B^2)*b^6*c^6 - 1728*(25*A^2
 + 10*A*B + 2*B^2)*a*b^5*c^5*d + 3375*(8*A^2 + 4*A*B + B^2)*a^2*b^4*c^4*d^2
 - (1800*A^2 + 2220*A*B + 919*B^2)*a^6*d^6)*i^3 + 1800*(B^2*b^6*d^6*i^3*x^6
 + 6*B^2*a*b^5*d^6*i^3*x^5 + 15*B^2*a^2*b^4*d^6*i^3*x^4 + 20*(B^2*b^6*c^3*d
^3 - 3*B^2*a*b^5*c^2*d^4 + 3*B^2*a^2*b^4*c*d^5)*i^3*x^3 + 15*(3*B^2*b^6*c^4
*d^2 - 8*B^2*a*b^5*c^3*d^3 + 6*B^2*a^2*b^4*c^2*d^4)*i^3*x^2 + 6*(6*B^2*b^6*
c^5*d - 15*B^2*a*b^5*c^4*d^2 + 10*B^2*a^2*b^4*c^3*d^3)*i^3*x + (10*B^2*b^6*
c^6 - 24*B^2*a*b^5*c^5*d + 15*B^2*a^2*b^4*c^4*d^2)*i^3)*log((b*e*x + a*e)/(
d*x + c))^2 + 60*((60*A*B + 37*B^2)*b^6*d^6*i^3*x^6 + 6*(10*B^2*b^6*c*d^5 +
 3*(20*A*B + 9*B^2)*a*b^5*d^6)*i^3*x^5 - 15*(2*B^2*b^6*c^2*d^4 - 24*B^2*a*b
^5*c*d^5 - 15*(4*A*B + B^2)*a^2*b^4*d^6)*i^3*x^4 + 20*((60*A*B + B^2)*b^6*c
^3*d^3 - 9*(20*A*B + B^2)*a*b^5*c^2*d^4 + 45*(4*A*B + B^2)*a^2*b^4*c*d^5)*i
^3*x^3 + 15*((180*A*B + 19*B^2)*b^6*c^4*d^2 - 24*(20*A*B + 3*B^2)*a*b^5*c^3
*d^3 + 90*(4*A*B + B^2)*a^2*b^4*c^2*d^4)*i^3*x^2 + 6*(4*(90*A*B + 13*B^2)*b
^6*c^5*d - 15*(60*A*B + 11*B^2)*a*b^5*c^4*d^2 + 150*(4*A*B + B^2)*a^2*b^4*c
^3*d^3)*i^3*x + (100*(6*A*B + B^2)*b^6*c^6 - 288*(5*A*B + B^2)*a*b^5*c^5*d
+ 225*(4*A*B + B^2)*a^2*b^4*c^4*d^2)*i^3)*log((b*e*x + a*e)/(d*x + c)))/((b
^13*c^3 - 3*a*b^12*c^2*d + 3*a^2*b^11*c*d^2 - a^3*b^10*d^3)*g^7*x^6 + 6*(a*
b^12*c^3 - 3*a^2*b^11*c^2*d + 3*a^3*b^10*c*d^2 - a^4*b^9*d^3)*g^7*x^5 + 15*
(a^2*b^11*c^3 - 3*a^3*b^10*c^2*d + 3*a^4*b^9*c*d^2 - a^5*b^8*d^3)*g^7*x^4 +
 20*(a^3*b^10*c^3 - 3*a^4*b^9*c^2*d + 3*a^5*b^8*c*d^2 - a^6*b^7*d^3)*g^7*x^
3 + 15*(a^4*b^9*c^3 - 3*a^5*b^8*c^2*d + 3*a^6*b^7*c*d^2 - a^7*b^6*d^3)*g^7*
```

```
x^2 + 6*(a^5*b^8*c^3 - 3*a^6*b^7*c^2*d + 3*a^7*b^6*c*d^2 - a^8*b^5*d^3)*g^7
*x + (a^6*b^7*c^3 - 3*a^7*b^6*c^2*d + 3*a^8*b^5*c*d^2 - a^9*b^4*d^3)*g^7)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**7,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^7, x)
```

3.84 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=718

$$\frac{2Bg^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^4i}+\frac{6B^2g^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}+\frac{7B^2g^3(bc-ad)^3\text{P}}{3}$$

```
[Out] (b*B^2*(b*c - a*d)^2*g^3*x)/(3*d^3*i) + (B^2*(b*c - a*d)^3*g^3*Log[(a + b*x
)/(c + d*x)])/(3*d^4*i) + (7*B*(b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(3*d^3*i) - (b^2*B*(b*c - a*d)*g^3*(c + d*x)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^4*i) + (6*B*(b*c - a*d)^3*g^3*Log[(b*c
 - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i) + (3*(
b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i)
- (3*b^2*(b*c - a*d)*g^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2
)/(2*d^4*i) + (b^3*g^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(3*d^4*i) + ((b*c - a*d)^3*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/(d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*Log[c + d*x])
/(d^4*i) - (7*B*(b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[
1 - (b*(c + d*x))/(d*(a + b*x))])/(3*d^4*i) + (6*B^2*(b*c - a*d)^3*g^3*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i) + (2*B*(b*c - a*d)^3*g^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d
^4*i) + (7*B^2*(b*c - a*d)^3*g^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
3*d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]
)/(d^4*i)
```

Rubi [B] time = 5.61611, antiderivative size = 1828, normalized size of antiderivative = 2.55, number of steps used = 106, number of rules used = 28, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 43, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x),
x]
```

```
[Out] (5*A*b*B*(b*c - a*d)^2*g^3*x)/(3*d^3*i) + (b*B^2*(b*c - a*d)^2*g^3*x)/(3*d^
3*i) - (a*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]^2)/(d^3*i) + (B^2*(b*c - a*d)^
3*g^3*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(d^4*i) + (5*B^2*(
b*c - a*d)^2*g^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(3*d^3*i) - (B*(b*
c - a*d)*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^2*i) +
(2*a*B*(b*c - a*d)^2*g^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(d^3*i) + (b*(b*c - a*d)^2*g^3*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
d^3*i) - ((b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^
2)/(2*d^2*i) + (g^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*
d*i) - (2*B^2*(b*c - a*d)^3*g^3*Log[c + d*x])/(d^4*i) + (2*b*B^2*c*(b*c - a
*d)^2*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i) + (5*B^2*
(b*c - a*d)^3*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*d^4*i)
 - (2*b*B*c*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
d*x])/(d^4*i) - (5*B*(b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])
*Log[c + d*x])/(3*d^4*i) - (b*B^2*c*(b*c - a*d)^2*g^3*Log[c + d*x]^2)/(d^4*
```

```
i) - (5*B^2*(b*c - a*d)^3*g^3*Log[c + d*x]^2)/(6*d^4*i) + (2*a*B^2*(b*c - a
*d)^2*g^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (B^2*(b*c
- a*d)^3*g^3*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i) + (B^2*
(b*c - a*d)^3*g^3*Log[a + b*x]^2*Log[i*(c + d*x)])/(d^4*i) + (2*B^2*(b*c -
a*d)^3*g^3*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[i*(c + d*x)])/(d^4*i) - (A*
B*(b*c - a*d)^3*g^3*Log[i*(c + d*x)]^2)/(d^4*i) + (B^2*(b*c - a*d)^3*g^3*Lo
g[a + b*x]*Log[i*(c + d*x)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[i*(c + d*x)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3
*Log[i*(c + d*x)]^3)/(3*d^4*i) + (2*A*B*(b*c - a*d)^3*g^3*Log[-((d*(a + b*x
))/(b*c - a*d))]*Log[c*i + d*i*x])/(d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*Log[-
((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(
a + b*x))/(c + d*x)])*Log[c*i + d*i*x])/(d^4*i) - ((b*c - a*d)^3*g^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c*i + d*i*x])/(d^4*i) + (B^2*(b*c - a*
d)^3*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i + d*i*x]^2)/(d^4*i) - (B
^2*(b*c - a*d)^3*g^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c*i + d*i*x]^2)/(d^4*
i) + (2*a*B^2*(b*c - a*d)^2*g^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(
d^3*i) - (2*B^2*(b*c - a*d)^3*g^3*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(
b*c - a*d))])/(d^4*i) + (2*b*B^2*c*(b*c - a*d)^2*g^3*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(d^4*i) + (2*A*B*(b*c - a*d)^3*g^3*PolyLog[2, (b*(c + d*x)
)/(b*c - a*d)])/(d^4*i) + (5*B^2*(b*c - a*d)^3*g^3*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/(3*d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*Log[(c + d*x)^(-1)]*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*(Log
[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)])/(d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*PolyLog[3, -
((d*(a + b*x))/(b*c - a*d))])/(d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*PolyLog[3,
 (b*(c + d*x))/(b*c - a*d)])/(d^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84c+84dx}\,dx=\int\left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3}+\frac{(-bc+ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{d^3(84c+84dx)}\right.$$

$$=\frac{(bg)\int(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx}{84d}-\frac{\left(b(bc-ad)g^2\right)\int(ag+bgx)\left(A\right.}{84d^2}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{168d^2}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{168d^2}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{168d^2}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{84d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{168d^2}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}-\frac{B(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{252d^2}+\frac{aB(bc-}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{5B^2(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{252d^3}-\frac{B(bc-ad)g^3(a}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{5B^2(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{252d^3}-\frac{B(bc-ad)g^3(a}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}+\frac{5B^2(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx}{c+dx}\right.}{252d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}+\frac{5B^2(bc-ad)^2g^3(a+bx)\log\left(\frac{e(a+bx}{c+dx}\right.}{252d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}-\frac{aB^2(bc-ad)^2g^3\log^2(a+bx)}{84d^3}+\frac{5B}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}-\frac{aB^2(bc-ad)^2g^3\log^2(a+bx)}{84d^3}+\frac{5B}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}-\frac{aB^2(bc-ad)^2g^3\log^2(a+bx)}{84d^3}+\frac{5B}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}-\frac{aB^2(bc-ad)^2g^3\log^2(a+bx)}{84d^3}+\frac{B^2}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}-\frac{aB^2(bc-ad)^2g^3\log^2(a+bx)}{84d^3}+\frac{B^2}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{252d^3}+\frac{bB^2(bc-ad)^2g^3x}{252d^3}-\frac{aB^2(bc-ad)^2g^3\log^2(a+bx)}{84d^3}+\frac{B^2}{}$$

$$=\frac{5AbB(bc-ad)^2g^3x}{}+\frac{bB^2(bc-ad)^2g^3x}{}-\frac{aB^2(bc-ad)^2g^3\log^2(a+bx)}{}+\frac{B^2}{}$$

Mathematica [B] time = 1.85366, size = 4802, normalized size = 6.69

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x),x]
```

```
[Out] (g^3*(36*A*b^3*B*c^3 - 144*a*A*b^2*B*c^2*d - 66*a*b^2*B^2*c^2*d + 216*a^2*A
*b*B*c*d^2 + 162*a^2*b*B^2*c*d^2 - 108*a^3*A*B*d^3 - 108*a^3*B^2*d^3 + 18*A
^2*b^3*c^2*d*x + 30*A*b^3*B*c^2*d*x + 6*b^3*B^2*c^2*d*x - 54*a*A^2*b^2*c*d^
2*x - 72*a*A*b^2*B*c*d^2*x - 12*a*b^2*B^2*c*d^2*x + 54*a^2*A^2*b*d^3*x + 42
*a^2*A*b*B*d^3*x + 6*a^2*b*B^2*d^3*x - 9*A^2*b^3*c*d^2*x^2 - 6*A*b^3*B*c*d^
2*x^2 + 27*a*A^2*b^2*d^3*x^2 + 6*a*A*b^2*B*d^3*x^2 + 6*A^2*b^3*d^3*x^3 - 36
*b^3*B^2*c^3*Log[a/b + x] + 36*a*A*b^2*B*c^2*d*Log[a/b + x] + 174*a*b^2*B^2
*c^2*d*Log[a/b + x] - 108*a^2*A*b*B*c*d^2*Log[a/b + x] - 297*a^2*b*B^2*c*d^
2*Log[a/b + x] + 108*a^3*A*B*d^3*Log[a/b + x] + 167*a^3*B^2*d^3*Log[a/b + x
] - 18*a*b^2*B^2*c^2*d*Log[a/b + x]^2 + 63*a^2*b*B^2*c*d^2*Log[a/b + x]^2 -
 75*a^3*B^2*d^3*Log[a/b + x]^2 - 36*A*b^3*B*c^3*Log[c/d + x] - 49*b^3*B^2*c
^3*Log[c/d + x] + 108*a*A*b^2*B*c^2*d*Log[c/d + x] + 45*a*b^2*B^2*c^2*d*Log
[c/d + x] - 108*a^2*A*b*B*c*d^2*Log[c/d + x] + 108*a^2*b*B^2*c*d^2*Log[c/d
+ x] - 108*a^3*B^2*d^3*Log[c/d + x] + 36*b^3*B^2*c^3*Log[a/b + x]*Log[c/d +
 x] - 108*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[c/d + x] + 90*a^2*b*B^2*c*d^2*Lo
g[a/b + x]*Log[c/d + x] + 42*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x] + 18*A*b
^3*B*c^3*Log[c/d + x]^2 - 3*b^3*B^2*c^3*Log[c/d + x]^2 - 54*a*A*b^2*B*c^2*d
*Log[c/d + x]^2 + 27*a*b^2*B^2*c^2*d*Log[c/d + x]^2 + 54*a^2*A*b*B*c*d^2*Lo
g[c/d + x]^2 - 54*a^2*b*B^2*c*d^2*Log[c/d + x]^2 - 18*a^3*A*B*d^3*Log[c/d +
 x]^2 + 12*b^3*B^2*c^3*Log[c/d + x]^3 - 36*a*b^2*B^2*c^2*d*Log[c/d + x]^3 +
 36*a^2*b*B^2*c*d^2*Log[c/d + x]^3 + 18*a^2*A*b*B*c*d^2*Log[a + b*x] + 15*a
^2*b*B^2*c*d^2*Log[a + b*x] - 42*a^3*A*B*d^3*Log[a + b*x] - 23*a^3*B^2*d^3*
Log[a + b*x] - 18*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[a + b*x] + 42*a^3*B^2*d^
3*Log[a/b + x]*Log[a + b*x] + 18*a^2*b*B^2*c*d^2*Log[c/d + x]*Log[a + b*x]
- 42*a^3*B^2*d^3*Log[c/d + x]*Log[a + b*x] - 18*b^3*B^2*c^3*Log[c/d + x]^2*
Log[(d*(a + b*x))/(-(b*c) + a*d)] + 54*a*b^2*B^2*c^2*d*Log[c/d + x]^2*Log[(
d*(a + b*x))/(-(b*c) + a*d)] - 54*a^2*b*B^2*c*d^2*Log[c/d + x]^2*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] + 36*b^3*B^2*c^3*Log[(e*(a + b*x))/(c + d*x)] - 144
*a*b^2*B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)] + 216*a^2*b*B^2*c*d^2*Log[(e*
(a + b*x))/(c + d*x)] - 108*a^3*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)] + 36*A
*b^3*B*c^2*d*x*Log[(e*(a + b*x))/(c + d*x)] + 30*b^3*B^2*c^2*d*x*Log[(e*(a
+ b*x))/(c + d*x)] - 108*a*A*b^2*B*c*d^2*x*Log[(e*(a + b*x))/(c + d*x)] - 7
2*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x))/(c + d*x)] + 108*a^2*A*b*B*d^3*x*Log[
(e*(a + b*x))/(c + d*x)] + 42*a^2*b*B^2*d^3*x*Log[(e*(a + b*x))/(c + d*x)]
- 18*A*b^3*B*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] - 6*b^3*B^2*c*d^2*x^2*L
og[(e*(a + b*x))/(c + d*x)] + 54*a*A*b^2*B*d^3*x^2*Log[(e*(a + b*x))/(c + d
*x)] + 6*a*b^2*B^2*d^3*x^2*Log[(e*(a + b*x))/(c + d*x)] + 12*A*b^3*B*d^3*x^
3*Log[(e*(a + b*x))/(c + d*x)] + 36*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(e*(a
+ b*x))/(c + d*x)] - 108*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[(e*(a + b*x))/(c
+ d*x)] + 108*a^3*B^2*d^3*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)] - 36*b^
3*B^2*c^3*Log[c/d + x]*Log[(e*(a + b*x))/(c + d*x)] + 108*a*b^2*B^2*c^2*d*L
og[c/d + x]*Log[(e*(a + b*x))/(c + d*x)] - 108*a^2*b*B^2*c*d^2*Log[c/d + x]
*Log[(e*(a + b*x))/(c + d*x)] + 18*b^3*B^2*c^3*Log[c/d + x]^2*Log[(e*(a + b
*x))/(c + d*x)] - 54*a*b^2*B^2*c^2*d*Log[c/d + x]^2*Log[(e*(a + b*x))/(c +
d*x)] + 54*a^2*b*B^2*c*d^2*Log[c/d + x]^2*Log[(e*(a + b*x))/(c + d*x)] + 18
*a^2*b*B^2*c*d^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 42*a^3*B^2*d^3
*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 18*b^3*B^2*c^2*d*x*Log[(e*(a +
 b*x))/(c + d*x)]^2 - 54*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x))/(c + d*x)]^2 +
 54*a^2*b*B^2*d^3*x*Log[(e*(a + b*x))/(c + d*x)]^2 - 9*b^3*B^2*c*d^2*x^2*Lo
g[(e*(a + b*x))/(c + d*x)]^2 + 27*a*b^2*B^2*d^3*x^2*Log[(e*(a + b*x))/(c +
```

d*x)]^2 + 6*b^3*B^2*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)]^2 - 18*A^2*b^3*c^3
*Log[c + d*x] - 30*A*b^3*B*c^3*Log[c + d*x] + 49*b^3*B^2*c^3*Log[c + d*x] +
54*a*A^2*b^2*c^2*d*Log[c + d*x] + 54*a*A*b^2*B*c^2*d*Log[c + d*x] - 111*a*
b^2*B^2*c^2*d*Log[c + d*x] - 54*a^2*A^2*b*c*d^2*Log[c + d*x] + 66*a^2*b*B^2
*c*d^2*Log[c + d*x] + 18*a^3*A^2*d^3*Log[c + d*x] + 36*A*b^3*B*c^3*Log[a/b
+ x]*Log[c + d*x] + 30*b^3*B^2*c^3*Log[a/b + x]*Log[c + d*x] - 108*a*A*b^2*
B*c^2*d*Log[a/b + x]*Log[c + d*x] - 54*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[c +
d*x] + 108*a^2*A*b*B*c*d^2*Log[a/b + x]*Log[c + d*x] - 36*a^3*A*B*d^3*Log[
a/b + x]*Log[c + d*x] - 18*b^3*B^2*c^3*Log[a/b + x]^2*Log[c + d*x] + 54*a*b
^2*B^2*c^2*d*Log[a/b + x]^2*Log[c + d*x] - 54*a^2*b*B^2*c*d^2*Log[a/b + x]^
2*Log[c + d*x] - 36*A*b^3*B*c^3*Log[c/d + x]*Log[c + d*x] - 30*b^3*B^2*c^3*
Log[c/d + x]*Log[c + d*x] + 108*a*A*b^2*B*c^2*d*Log[c/d + x]*Log[c + d*x] +
54*a*b^2*B^2*c^2*d*Log[c/d + x]*Log[c + d*x] - 108*a^2*A*b*B*c*d^2*Log[c/d
+ x]*Log[c + d*x] + 36*a^3*A*B*d^3*Log[c/d + x]*Log[c + d*x] + 36*b^3*B^2*
c^3*Log[a/b + x]*Log[c/d + x]*Log[c + d*x] - 108*a*b^2*B^2*c^2*d*Log[a/b +
x]*Log[c/d + x]*Log[c + d*x] + 108*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[c/d + x
]*Log[c + d*x] - 18*b^3*B^2*c^3*Log[c/d + x]^2*Log[c + d*x] + 54*a*b^2*B^2*
c^2*d*Log[c/d + x]^2*Log[c + d*x] - 54*a^2*b*B^2*c*d^2*Log[c/d + x]^2*Log[c
+ d*x] - 36*A*b^3*B*c^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 30*b^3
*B^2*c^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] + 108*a*A*b^2*B*c^2*d*Lo
g[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] + 54*a*b^2*B^2*c^2*d*Log[(e*(a + b*
x))/(c + d*x)]*Log[c + d*x] - 108*a^2*A*b*B*c*d^2*Log[(e*(a + b*x))/(c + d*
x)]*Log[c + d*x] + 36*a^3*A*B*d^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]
+ 36*b^3*B^2*c^3*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] -
108*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]
+ 108*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x
] - 36*b^3*B^2*c^3*Log[c/d + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] +
108*a*b^2*B^2*c^2*d*Log[c/d + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]
- 108*a^2*b*B^2*c*d^2*Log[c/d + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*
x] - 18*b^3*B^2*c^3*Log[(e*(a + b*x))/(c + d*x)]^2*Log[c + d*x] + 54*a*b^2*
B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)]^2*Log[c + d*x] - 54*a^2*b*B^2*c*d^2*
Log[(e*(a + b*x))/(c + d*x)]^2*Log[c + d*x] - 36*A*b^3*B*c^3*Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] - 66*b^3*B^2*c^3*Log[a/b + x]*Log[(b*(c + d*x
))/(b*c - a*d)] + 108*a*A*b^2*B*c^2*d*Log[a/b + x]*Log[(b*(c + d*x))/(b*c -
a*d)] + 198*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] -
108*a^2*A*b*B*c*d^2*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] - 198*a^2*b
*B^2*c*d^2*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + 36*a^3*A*B*d^3*Log
[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + 66*a^3*B^2*d^3*Log[a/b + x]*Log[
(b*(c + d*x))/(b*c - a*d)] + 18*b^3*B^2*c^3*Log[a/b + x]^2*Log[(b*(c + d*x)
)/(b*c - a*d)] - 54*a*b^2*B^2*c^2*d*Log[a/b + x]^2*Log[(b*(c + d*x))/(b*c -
a*d)] + 54*a^2*b*B^2*c*d^2*Log[a/b + x]^2*Log[(b*(c + d*x))/(b*c - a*d)] -
36*b^3*B^2*c^3*Log[a/b + x]*Log[c/d + x]*Log[(b*(c + d*x))/(b*c - a*d)] +
108*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[c/d + x]*Log[(b*(c + d*x))/(b*c - a*d)
] - 108*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[c/d + x]*Log[(b*(c + d*x))/(b*c -
a*d)] - 36*b^3*B^2*c^3*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*(c
+ d*x))/(b*c - a*d)] + 108*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(e*(a + b*x))/(
c + d*x)]*Log[(b*(c + d*x))/(b*c - a*d)] - 108*a^2*b*B^2*c*d^2*Log[a/b + x]
Log[(e(a + b*x))/(c + d*x)]*Log[(b*(c + d*x))/(b*c - a*d)] - 18*a^3*B^2*d
^3*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*B*((6*
A + 11*B)*(b*c - a*d)^3 + 6*b*B*c*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*Log[c/d
+ x] + 6*b*B*c*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*Log[(e*(a + b*x))/(c + d*
x)])*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 36*a^3*B^2*d^3*Log[(e*(a +
b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 36*b^3*B^2*c^3*L
og[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 108*a*b^2*B^2*c^2*d*Log
[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 108*a^2*b*B^2*c*d^2*Log[c
/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 36*b^3*B^2*c^3*PolyLog[3, (
d*(a + b*x))/(-(b*c) + a*d)] - 108*a*b^2*B^2*c^2*d*PolyLog[3, (d*(a + b*x))
/(-(b*c) + a*d)] + 108*a^2*b*B^2*c*d^2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a
*d)] + 36*a^3*B^2*d^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 36*b^3*B^2*

```
c^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] - 108*a*b^2*B^2*c^2*d*PolyLog[3,
(b*(c + d*x))/(b*c - a*d)] + 108*a^2*b*B^2*c*d^2*PolyLog[3, (b*(c + d*x))/(
b*c - a*d)]))/(18*d^4*i)
```

Maple [F] time = 2.514, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{3}}{dix+ci}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] 3*A^2*a^2*b*g^3*(x/(d*i) - c*log(d*x + c)/(d^2*i)) - 1/6*A^2*b^3*g^3*(6*c^3
*log(d*x + c)/(d^4*i) - (2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/(d^3*i)) + 3/2*A^
2*a*b^2*g^3*(2*c^2*log(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A^2*a^
3*g^3*log(d*i*x + c*i)/(d*i) - 1/6*(2*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*
a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*B^2*log(d*x + c)^3 - (2*B^2*b^3*d^3*g^3*x^3
- 3*(b^3*c*d^2*g^3 - 3*a*b^2*d^3*g^3)*B^2*x^2 + 6*(b^3*c^2*d*g^3 - 3*a*b^2*
c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B^2*x)*log(d*x + c)^2)/(d^4*i) - integrate(-1/
3*(3*B^2*a^3*d^2*g^3*log(e)^2 + 6*A*B*a^3*d^2*g^3*log(e) + 3*(B^2*b^3*d^2*g
^3*log(e)^2 + 2*A*B*b^3*d^2*g^3*log(e))*x^3 + 9*(B^2*a*b^2*d^2*g^3*log(e)^2
 + 2*A*B*a*b^2*d^2*g^3*log(e))*x^2 + 3*(B^2*b^3*d^2*g^3*x^3 + 3*B^2*a*b^2*d
^2*g^3*x^2 + 3*B^2*a^2*b*d^2*g^3*x + B^2*a^3*d^2*g^3)*log(b*x + a)^2 + 9*(B
^2*a^2*b*d^2*g^3*log(e)^2 + 2*A*B*a^2*b*d^2*g^3*log(e))*x + 6*(B^2*a^3*d^2*
g^3*log(e) + A*B*a^3*d^2*g^3 + (B^2*b^3*d^2*g^3*log(e) + A*B*b^3*d^2*g^3)*x
^3 + 3*(B^2*a*b^2*d^2*g^3*log(e) + A*B*a*b^2*d^2*g^3)*x^2 + 3*(B^2*a^2*b*d^
2*g^3*log(e) + A*B*a^2*b*d^2*g^3)*x)*log(b*x + a) - (6*B^2*a^3*d^2*g^3*log(
e) + 6*A*B*a^3*d^2*g^3 + 2*(3*A*B*b^3*d^2*g^3 + (3*g^3*log(e) + g^3)*B^2*b^
3*d^2)*x^3 + 3*(6*A*B*a*b^2*d^2*g^3 - (b^3*c*d*g^3 - 3*(2*g^3*log(e) + g^3)
*a*b^2*d^2)*B^2)*x^2 + 6*(3*A*B*a^2*b*d^2*g^3 + (b^3*c^2*g^3 - 3*a*b^2*c*d*
g^3 + 3*(g^3*log(e) + g^3)*a^2*b*d^2)*B^2)*x + 6*(B^2*b^3*d^2*g^3*x^3 + 3*B
^2*a*b^2*d^2*g^3*x^2 + 3*B^2*a^2*b*d^2*g^3*x + B^2*a^3*d^2*g^3)*log(b*x + a
))*log(d*x + c))/(d^3*i*x + c*d^2*i), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^{2}b^{3}g^{3}x^{3}+3\,A^{2}ab^{2}g^{3}x^{2}+3\,A^{2}a^{2}bg^{3}x+A^{2}a^{3}g^{3}+\left(B^{2}b^{3}g^{3}x^{3}+3\,B^{2}ab^{2}g^{3}x^{2}+3\,B^{2}a^{2}bg^{3}x+B^{2}a^{3}g^{3}\right)\log\left(\right.}{dix+ci}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a
^3*g^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g
^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((b*e*x + a*e)/(d*x + c)))/(d*
i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^3 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i
), x)
```

3.85 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=536

$$-\frac{2Bg^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i}-\frac{4B^2g^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}-\frac{B^2g^2(bc-ad)^2\text{P}}{}$$

```
[Out] -((B*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i
)) - (4*B*(b*c - a*d)^2*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(d^3*i) - (2*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)])^2)/(d^2*i) + (b^2*g^2*(c + d*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2)/(2*d^3*i) - ((b*c - a*d)^2*g^2*Log[(b*c - a*d)/(b*(c
+ d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i) + (B^2*(b*c - a*d)
^2*g^2*Log[c + d*x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(d^3*i) - (4*B^2*(b*c -
 a*d)^2*g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i) - (2*B*(b*c -
a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b
*(c + d*x))])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*PolyLog[2, (b*(c + d*x))/(d*
(a + b*x))])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*PolyLog[3, (d*(a + b*x))/(b
*(c + d*x))])/(d^3*i)
```

Rubi [B] time = 4.82488, antiderivative size = 1666, normalized size of antiderivative = 3.11, number of steps used = 86, number of rules used = 27, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.643, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x),
x]
```

```
[Out] -((A*b*B*(b*c - a*d)*g^2*x)/(d^2*i)) + (a*B^2*(b*c - a*d)*g^2*Log[a + b*x]^
2)/(d^2*i) - (B^2*(b*c - a*d)^2*g^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(d^
3*i) + (B^2*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*
x)^(-1)]^2)/(d^3*i) - (B^2*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x))/(c +
 d*x)])/(d^2*i) - (2*a*B*(b*c - a*d)*g^2*Log[a + b*x]*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(d^2*i) - (b*(b*c - a*d)*g^2*x*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])^2)/(d^2*i) + (g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2)/(2*d*i) + (B^2*(b*c - a*d)^2*g^2*Log[c + d*x])/(d^3*i) - (2*b*B^2*c*(b
*c - a*d)*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3*i) - (B^
2*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3*i)
 + (2*b*B*c*(b*c - a*d)*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*
x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[c + d*x])/(d^3*i) + (b*B^2*c*(b*c - a*d)*g^2*Log[c + d*x]^2)/(d^3*i) + (B^
2*(b*c - a*d)^2*g^2*Log[c + d*x]^2)/(2*d^3*i) - (2*a*B^2*(b*c - a*d)*g^2*Lo
g[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*i) + (B^2*(b*c - a*d)^2*g^2
*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (B^2*(b*c - a*d)^
2*g^2*Log[a + b*x]^2*Log[i*(c + d*x)])/(d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*L
og[a + b*x]*Log[(c + d*x)^(-1)]*Log[i*(c + d*x)])/(d^3*i) + (A*B*(b*c - a*d
)^2*g^2*Log[i*(c + d*x)]^2)/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*Log[a + b*x]*L
og[i*(c + d*x)]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x))/(b*
c - a*d))]*Log[i*(c + d*x)]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*Log[i*(c +
```

```
d*x)]^3)/(3*d^3*i) - (2*A*B*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x))/(b*c - a*
d))]*Log[c*i + d*i*x])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x
))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c
 + d*x)])*Log[c*i + d*i*x])/(d^3*i) + ((b*c - a*d)^2*g^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2*Log[c*i + d*i*x])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*Log
[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i + d*i*x]^2)/(d^3*i) + (B^2*(b*c - a*
d)^2*g^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c*i + d*i*x]^2)/(d^3*i) - (2*a*B^
2*(b*c - a*d)*g^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i) + (2*B^
2*(b*c - a*d)^2*g^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/
(d^3*i) - (2*b*B^2*c*(b*c - a*d)*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(d^3*i) - (2*A*B*(b*c - a*d)^2*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/
(d^3*i) - (B^2*(b*c - a*d)^2*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^
3*i) - (2*B^2*(b*c - a*d)^2*g^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x)
)/(b*c - a*d)])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*(Log[a + b*x] + Log[(c +
 d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(b*c -
 a*d)])/(d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*PolyLog[3, -((d*(a + b*x))/(b*c
- a*d))])/(d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*PolyLog[3, (b*(c + d*x))/(b*c
- a*d)])/(d^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
```

```
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85c+85dx}\,dx=\int\left(-\frac{b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2}+\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{d^2(85c+85dx)}\right.$$

$$=\frac{(bg)\int(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx}{85d}-\frac{\left(b(bc-ad)g^2\right)\int\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{85d^2}$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{170d}+$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{170d}+$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{170d}+$$

$$=-\frac{b(bc-ad)g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{85d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{170d}+$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}-\frac{2aB(bc-ad)g^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{85d^2}-b(bc$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}-\frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2}-2aB(bc-ad)g^2\log$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}-\frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2}-2aB(bc-ad)g^2\log$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}-\frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2}-2aB(bc-ad)g^2\log$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}-\frac{B^2(bc-ad)g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{85d^2}-2aB(bc-ad)g^2\log$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}+\frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2}-\frac{B^2(bc-ad)g^2(a+bx)\log}{85d^2}$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}+\frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2}-\frac{B^2(bc-ad)g^2(a+bx)\log}{85d^2}$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}+\frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2}-\frac{B^2(bc-ad)g^2(a+bx)\log}{85d^2}$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}+\frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2}-\frac{B^2(bc-ad)^2g^2\log(a+b}{85d^3}$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}+\frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2}-\frac{B^2(bc-ad)^2g^2\log(a+b}{85d^3}$$

$$=-\frac{AbB(bc-ad)g^2x}{85d^2}+\frac{aB^2(bc-ad)g^2\log^2(a+bx)}{85d^2}-\frac{B^2(bc-ad)^2g^2\log(a+b}{85d^3}$$

$$=-AbB(bc-ad)g^2x+aB^2(bc-ad)g^2\log^2(a+bx)-B^2(bc-ad)^2g^2\log(a+b$$

Mathematica [B] time = 1.67134, size = 1514, normalized size = 2.82

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x),x]
```

```
[Out] (g^2*(-2*A^2*b*d*(b*c - 2*a*d)*x + A^2*b^2*d^2*x^2 + 2*A^2*(b*c - a*d)^2*Lo
g[c + d*x] + 2*A*B*(-2*b^2*c^2 + 2*a*b*c*d - b^2*c*d*x + a*b*d^2*x + 2*b^2*
c^2*Log[c/d + x] - b^2*c^2*Log[c/d + x]^2 - a^2*d^2*Log[a + b*x] - 2*b^2*c*
d*x*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]
 + b^2*c^2*Log[c + d*x] + 2*b^2*c^2*Log[c/d + x]*Log[c + d*x] + 2*b^2*c^2*L
og[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 2*b*c*Log[a/b + x]*(a*d + b*c*Lo
g[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*b^2*c^2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)]) - 2*a^2*A*B*d^2*(Log[c/d + x]^2 + 2*(Log[a/b +
x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b
 + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)])) - 4*a*A*B*d*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*(-1
+ Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x] - L
og[(e*(a + b*x))/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
+ 4*a*B^2*d*(d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + b*c*Log[(e*(a + b
*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c -
a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(e*(a + b*
x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)]) + 2*b*c*(Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b
*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + B^2*(2*d*
(-(b*c) + a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 2*a^2*d^2*Log[a + b
*x]*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]
^2 - 2*b*c*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log
[c + d*x] - 2*b^2*c^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b
*d*x)] - 2*b^2*c^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*
d*x)] + a^2*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*
d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b^2*c^2*(Log[(b*c - a*
d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b
*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(b*c - a*d
)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*
Log[(e*(a + b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)]) - 4*b^2*c^2*(Log[(e*(a + b*x))/(c + d*x)]*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*
x))])) - 2*a^2*B^2*d^2*(Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c
 + b*d*x)] + 2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))] - 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(2*d^3*i)
```

Maple [F] time = 2.291, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{dix + ci}\left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,A^2abg^2\left(\frac{x}{di} - \frac{c\log\left(dx+c\right)}{d^2i}\right) + \frac{1}{2}\,A^2b^2g^2\left(\frac{2\,c^2\log\left(dx+c\right)}{d^3i} + \frac{dx^2-2\,cx}{d^2i}\right) + \frac{A^2a^2g^2\log\left(dix+ci\right)}{di} + \frac{2\left(b^2c^2g^2-2\,abcdg\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] 2*A^2*a*b*g^2*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + 1/2*A^2*b^2*g^2*(2*c^2*l
og(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A^2*a^2*g^2*log(d*i*x + c*
i)/(d*i) + 1/6*(2*(b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2*log(d*x +
 c)^3 + 3*(B^2*b^2*d^2*g^2*x^2 - 2*(b^2*c*d*g^2 - 2*a*b*d^2*g^2)*B^2*x)*log
(d*x + c)^2)/(d^3*i) - integrate(-(B^2*a^2*d*g^2*log(e)^2 + 2*A*B*a^2*d*g^2
*log(e) + (B^2*b^2*d*g^2*log(e)^2 + 2*A*B*b^2*d*g^2*log(e))*x^2 + (B^2*b^2*
d*g^2*x^2 + 2*B^2*a*b*d*g^2*x + B^2*a^2*d*g^2)*log(b*x + a)^2 + 2*(B^2*a*b*
d*g^2*log(e)^2 + 2*A*B*a*b*d*g^2*log(e))*x + 2*(B^2*a^2*d*g^2*log(e) + A*B*
a^2*d*g^2 + (B^2*b^2*d*g^2*log(e) + A*B*b^2*d*g^2)*x^2 + 2*(B^2*a*b*d*g^2*l
og(e) + A*B*a*b*d*g^2)*x)*log(b*x + a) - (2*B^2*a^2*d*g^2*log(e) + 2*A*B*a^
2*d*g^2 + (2*A*B*b^2*d*g^2 + (2*g^2*log(e) + g^2)*B^2*b^2*d)*x^2 + 2*(2*A*B
*a*b*d*g^2 - (b^2*c*g^2 - 2*(g^2*log(e) + g^2)*a*b*d)*B^2)*x + 2*(B^2*b^2*d
*g^2*x^2 + 2*B^2*a*b*d*g^2*x + B^2*a^2*d*g^2)*log(b*x + a))*log(d*x + c))/(
d^2*i*x + c*d*i), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABb^2g^2x^2 + 2\,ABabg^2\right.}{dix+ci}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^
2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*
b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/
(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i
), x)
```

3.86 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=283

$$\frac{2Bg(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i}+\frac{2B^2g(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}-\frac{2B^2g(bc-ad)\text{PolyLog}\left(\right.}{d^2i}$$

```
[Out] (2*B*(b*c - a*d)*g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/(d^2*i) + (g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(d*i) + ((b*c - a*d)*g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(d^2*i) + (2*B^2*(b*c - a*d)*g*PolyLog[2, (d*(a + b*x))
/(b*(c + d*x))])/(d^2*i) + (2*B*(b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i) - (2*B^2*(b*c - a*
d)*g*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i)
```

Rubi [B] time = 4.13182, antiderivative size = 1072, normalized size of antiderivative = 3.79, number of steps used = 68, number of rules used = 24, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$-\frac{B^2(bc-ad)g\log^3(c+dx)}{3d^2i}+\frac{B^2(bc-ad)g\log(a+bx)\log^2(c+dx)}{d^2i}-\frac{B^2(bc-ad)g\log\left(\frac{e(a+bx)}{c+dx}\right)\log^2(c+dx)}{d^2i}-\frac{AB(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x),x]
```

```
[Out] -((a*B^2*g*Log[a + b*x]^2)/(d*i)) + (B^2*(b*c - a*d)*g*Log[a + b*x]*Log[(c
+ d*x)^(-1)]^2)/(d^2*i) - (B^2*(b*c - a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[(c + d*x)^(-1)]^2)/(d^2*i) + (2*a*B*g*Log[a + b*x]*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(d*i) + (b*g*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2
)/(d*i) + (B^2*(b*c - a*d)*g*Log[a + b*x]^2*Log[c + d*x])/(d^2*i) + (2*b*B^
2*c*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*i) + (2*A*B*(b*c
 - a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*i) + (2*B^2*
(b*c - a*d)*g*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/(d^2*i) - (2*B
^2*(b*c - a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c +
 d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^2*i) - (2*b*B*
c*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^2*i) - ((b*c - a*
d)*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/(d^2*i) - (b*B^2*
c*g*Log[c + d*x]^2)/(d^2*i) - (A*B*(b*c - a*d)*g*Log[c + d*x]^2)/(d^2*i) +
(B^2*(b*c - a*d)*g*Log[a + b*x]*Log[c + d*x]^2)/(d^2*i) - (B^2*(b*c - a*d)*
g*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/(d^2*i) - (B^2*(b*c - a*d)*g
*Log[c + d*x]^3)/(3*d^2*i) + (2*a*B^2*g*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
 - a*d)])/(d*i) - (B^2*(b*c - a*d)*g*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c
- a*d)])/(d^2*i) + (2*a*B^2*g*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d*
i) - (2*B^2*(b*c - a*d)*g*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/(d^2*i) + (2*b*B^2*c*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i)
 + (2*A*B*(b*c - a*d)*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i) + (2
*B^2*(b*c - a*d)*g*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])/(d^2*i) - (2*B^2*(b*c - a*d)*g*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log
[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i) +
 (2*B^2*(b*c - a*d)*g*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i) + (
2*B^2*(b*c - a*d)*g*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86c+86dx}\,dx = \int \left(\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} + \frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d(c+dx)}\right)dx$$

$$= \frac{(bg)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{86d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}dx}{86d}$$

$$= \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{86d^2} - \frac{(b \ldots}{\ldots}$$

$$= \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{86d^2} - \frac{(b \ldots}{\ldots}$$

$$= \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{86d^2} - \frac{(b \ldots}{\ldots}$$

$$= \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{86d^2} + \frac{(a \ldots}{\ldots}$$

$$= \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{bBcg\left(A \ldots\right.}{\ldots}$$

$$= \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{bBcg\left(A \ldots\right.}{\ldots}$$

$$= \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{bBcg\left(A \ldots\right.}{\ldots}$$

$$= \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} - \frac{bBcg\left(A \ldots\right.}{\ldots}$$

$$= \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{86d} + \frac{bB^2cg\log \ldots}{\ldots}$$

$$= -\frac{aB^2g\log^2(a+bx)}{86d} + \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log \ldots\right.}{86d}$$

$$= -\frac{aB^2g\log^2(a+bx)}{86d} + \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log \ldots\right.}{86d}$$

$$= -\frac{aB^2g\log^2(a+bx)}{86d} + \frac{aBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{43d} + \frac{bgx\left(A+B\log \ldots\right.}{86d}$$

$$= -\frac{aB^2g\log^2(a+bx)}{86d} + \frac{B^2(bc-ad)g\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{86d^2} + \frac{aBg\log(a+bx) \ldots}{\ldots}$$

$$= -\frac{aB^2g\log^2(a+bx)}{86d} + \frac{B^2(bc-ad)g\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{86d^2} - \frac{B^2(bc-ad)g\log \ldots}{\ldots}$$

$$= -\frac{aB^2g\log^2(a+bx)}{86d} + \frac{B^2(bc-ad)g\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{86d^2} - \frac{B^2(bc-ad)g\log \ldots}{\ldots}$$

$$= -\frac{aB^2g\log^2(a+bx)}{\ldots} + \frac{B^2(bc-ad)g\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{\ldots} - \frac{B^2(bc-ad)g\log \ldots}{\ldots}$$

Mathematica [B] time = 0.749911, size = 646, normalized size = 2.28

$$-\frac{g\left(aABd\left(-2\left(\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2\log(c+dx)\left(-\log\left(\frac{e(a+bx)}{c+dx}\right)+\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i
*x),x]
```

```
[Out] -((g*(-(A^2*b*d*x) + A^2*(b*c - a*d)*Log[c + d*x] + a*A*B*d*(Log[c/d + x]^2
 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d
*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)])) + A*B*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c +
 d*x)*(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/
d + x] - Log[(e*(a + b*x))/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[
a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c)
+ a*d)])) - B^2*(d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + b*c*Log[(e*(a
 + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*
c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(e*(a
+ b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)]) + 2*b*c*(Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a
 + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + a*B^2
*d*(Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(
e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog
[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i))
```

Maple [F] time = 2.141, size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{dix+ci}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^{2}bg\left(\frac{x}{di}-\frac{c\log\left(dx+c\right)}{d^{2}i}\right)+\frac{A^{2}ag\log\left(dix+ci\right)}{di}+\frac{3\,B^{2}bdgx\log\left(dx+c\right)^{2}-\left(bcg-adg\right)B^{2}\log\left(dx+c\right)^{3}}{3\,d^{2}i}-\int-\frac{B^{2}ag\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] A^2*b*g*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + A^2*a*g*log(d*i*x + c*i)/(d*i)
 + 1/3*(3*B^2*b*d*g*x*log(d*x + c)^2 - (b*c*g - a*d*g)*B^2*log(d*x + c)^3)/
(d^2*i) - integrate(-(B^2*a*g*log(e)^2 + 2*A*B*a*g*log(e) + (B^2*b*g*x + B^
2*a*g)*log(b*x + a)^2 + (B^2*b*g*log(e)^2 + 2*A*B*b*g*log(e))*x + 2*(B^2*a*
g*log(e) + A*B*a*g + (B^2*b*g*log(e) + A*B*b*g)*x)*log(b*x + a) - 2*(B^2*a*
```

```
g*log(e) + A*B*a*g + ((g*log(e) + g)*B^2*b + A*B*b*g)*x + (B^2*b*g*x + B^2*
a*g)*log(b*x + a))*log(d*x + c))/(d*i*x + c*i), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{bex+ae}{dx+c}\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] integral((A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*e*x + a*e)/(d*
x + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*e*x + a*e)/(d*x + c)))/(d*i*x +
c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{dix + ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i),
 x)
```

3.87 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=127

$$-\frac{2B\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di}+\frac{2B^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{di}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{di}$$

```
[Out] -((Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
d*i)) - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/
(b*(c + d*x))])/(d*i) + (2*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d*
i)
```

Rubi [B] time = 3.26832, antiderivative size = 721, normalized size of antiderivative = 5.68, number of steps used = 46, number of rules used = 23, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.719, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

$$-\frac{2AB\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di}+\frac{2B^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)\left(-\log\left(\frac{e(a+bx)}{c+dx}\right)+\log(a+bx)+\log\left(\frac{1}{c+dx}\right)\right)}{di}-\frac{2B^2\text{PolyLog}\left(3,\right.}{di}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x),x]
```

```
[Out] -((B^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(d*i)) + (B^2*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(d*i) + (B^2*Log[a + b*x]^2*Log[(b*(
c + d*x))/(b*c - a*d)])/(d*i) - (B^2*Log[a + b*x]^2*Log[i*(c + d*x)])/(d*i)
 - (2*B^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[i*(c + d*x)])/(d*i) + (A*B*L
og[i*(c + d*x)]^2)/(d*i) - (B^2*Log[a + b*x]*Log[i*(c + d*x)]^2)/(d*i) + (B
^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[i*(c + d*x)]^2)/(d*i) + (B^2*Log[i
*(c + d*x)]^3)/(3*d*i) - (2*A*B*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i +
 d*i*x])/(d*i) + (2*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + L
og[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c*i + d*i*x])/(d*i)
+ ((A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c*i + d*i*x])/(d*i) - (B^2*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i + d*i*x]^2)/(d*i) + (B^2*Log[(e*(a
+ b*x))/(c + d*x)]*Log[c*i + d*i*x]^2)/(d*i) + (2*B^2*Log[a + b*x]*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))])/(d*i) - (2*A*B*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)])/(d*i) - (2*B^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(d*i) + (2*B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a
+ b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*i) - (2*B^2*P
olyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(d*i) - (2*B^2*PolyLog[3, (b*(c +
d*x))/(b*c - a*d)])/(d*i)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
```

```
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{87c+87dx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(}{e(a+bx)}}{87d}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(}{a+bx}}{87de}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B)\int \frac{(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(87c+87dx)}{(a+bx)(c+dx)}\,dx}{87de}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(87c+87dx)}{(a+bx)(c+dx)}\,d}{87d}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{(2B(bc-ad))\int\left(\frac{d\left(-A-B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(87c+87d}{(bc-ad)(c+dx)}\right.}{87d}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{1}{87}(2B)\int \frac{\left(-A-B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(87c+8}{c+dx}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{1}{87}(2B)\int\left(\frac{A\log(87c+87dx)}{-c-dx} + \frac{B\log\left(\frac{e(a+}{c+d}\right.}{}\right.$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} - \frac{1}{87}(2AB)\int \frac{\log(87c+87dx)}{-c-dx}\,dx - \frac{1}{87}\left(2B^2\right)$$

$$= -\frac{2AB\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(87c+87dx)}{87d} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(87c+87dx)}{87d} + \frac{B^2 l}{}$$

$$= -\frac{2AB\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(87c+87dx)}{87d} + \frac{2B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\left(\log(a+bx)+\log\left(\frac{1}{c+dx}\right)-\right.}{87d}$$

$$= -\frac{B^2\log^2(a+bx)\log(87(c+dx))}{87d} - \frac{2B^2\log(a+bx)\log\left(\frac{1}{c+dx}\right)\log(87(c+dx))}{87d} + \frac{AB\,l}{}$$

$$= -\frac{B^2\log^2(a+bx)\log(87(c+dx))}{87d} - \frac{2B^2\log(a+bx)\log\left(\frac{1}{c+dx}\right)\log(87(c+dx))}{87d} + \frac{AB\,l}{}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2\log^2(a+bx)\log(87(c+dx))}{87d} - \frac{2B^2\log(a+bx)\log\left(\right.}{87}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{87d} + \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2\log^2(a+bx)\log(87(}{87d}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{87d} + \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2\log^2(a+bx)\log(87(}{87d}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{87d} + \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2\log^2(a+bx)\log(87(}{87d}$$

Mathematica [A] time = 0.252336, size = 251, normalized size = 1.98

$$\frac{2AB\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)-2B^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)+2B^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)+2AB\log(c+dx)\log\left(\frac{e(a+b}{c+d}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x),x]
```

```
[Out] (-(A*B*Log[c/d + x]^2) + A^2*Log[c + d*x] - 2*A*B*Log[a/b + x]*Log[c + d*x]
 + 2*A*B*Log[c/d + x]*Log[c + d*x] + 2*A*B*Log[(e*(a + b*x))/(c + d*x)]*Log
[c + d*x] + 2*A*B*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] - B^2*Log[(e*
(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*A*B*PolyLog[2, (
d*(a + b*x))/(-(b*c) + a*d)] - 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2
, (d*(a + b*x))/(b*(c + d*x))] + 2*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x
))])/(d*i)
```

Maple [B] time = 0.069, size = 888, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x)
```

```
[Out] -1/i/(a*d-b*c)*A^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d/i/(a*d-b*c
)*A^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b*c-1/i/(a*d-b*c)*B^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^2*ln(1-1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+1/
d/i/(a*d-b*c)*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(1-1/b/e*d*(b*e/d+(a*
d-b*c)*e/d/(d*x+c)))*b*c-2/i/(a*d-b*c)*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
polylog(2,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+2/d/i/(a*d-b*c)*B^2*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*polylog(2,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
)*b*c+2/i/(a*d-b*c)*B^2*polylog(3,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a-
2/d/i/(a*d-b*c)*B^2*polylog(3,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*c-2/
i/(a*d-b*c)*A*B*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+2/d/i/(
a*d-b*c)*A*B*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-2/i/(a*d
-b*c)*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-b*e)/b/e)*a+2/d/i/(a*d-b*c)*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{B^2\log(dx+c)^3}{3\,di}+\frac{A^2\log(dix+ci)}{di}-\int-\frac{B^2\log(bx+a)^2+B^2\log(e)^2+2\,AB\log(e)+2\left(B^2\log(e)+AB\right)\log(bx+a)}{dix+ci}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="maxima")
```

```
[Out] 1/3*B^2*log(d*x + c)^3/(d*i) + A^2*log(d*i*x + c*i)/(d*i) - integrate(-(B^2
*log(b*x + a)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log(e) + A*B)*log(b*
x + a) - 2*(B^2*log(b*x + a) + B^2*log(e) + A*B)*log(d*x + c))/(d*i*x + c*i
), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{dix+ci},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i), x)
```

3.88 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=44

$$\frac{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bgi(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x))/(c + d*x)])^3/(3*B*(b*c - a*d)*g*i)
```

Rubi [C] time = 5.53107, antiderivative size = 1163, normalized size of antiderivative = 26.43, number of steps used = 61, number of rules used = 29, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.69, Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$-\frac{B^2\log^3(c+dx)}{3(bc-ad)gi}+\frac{B^2\log(a+bx)\log^2(c+dx)}{(bc-ad)gi}-\frac{B^2\log\left(\frac{e(a+bx)}{c+dx}\right)\log^2(c+dx)}{(bc-ad)gi}-\frac{AB\log^2(c+dx)}{(bc-ad)gi}+\frac{B^2\log^2(a+bx)\log(}{(bc-ad)gi}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*x)),x]
```

```
[Out] -((A*B*Log[a + b*x]^2)/((b*c - a*d)*g*i)) + (B^2*Log[a + b*x]*Log[(c + d*x)
^(-1)]^2)/((b*c - a*d)*g*i) - (B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c
 + d*x)^(-1)]^2)/((b*c - a*d)*g*i) - (B^2*Log[-((b*c - a*d)/(d*(a + b*x)))]
*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)*g*i) - (B^2*Log[a + b*x]*Log[
(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)*g*i) + (Log[a + b*x]*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)*g*i) + (B^2*Log[a + b*x]^2*Log[c +
d*x])/((b*c - a*d)*g*i) + (2*A*B*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
d*x])/((b*c - a*d)*g*i) + (2*B^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d
*x])/((b*c - a*d)*g*i) - (2*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a +
b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((
b*c - a*d)*g*i) - ((A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/((b
*c - a*d)*g*i) - (A*B*Log[c + d*x]^2)/((b*c - a*d)*g*i) + (B^2*Log[a + b*x]
*Log[c + d*x]^2)/((b*c - a*d)*g*i) - (B^2*Log[(e*(a + b*x))/(c + d*x)]*Log[
c + d*x]^2)/((b*c - a*d)*g*i) - (B^2*Log[c + d*x]^3)/(3*(b*c - a*d)*g*i) +
(2*A*B*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) - (B^
2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*A*B
*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)*g*i) - (2*B^2*Log[a
 + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)*g*i) + (2*A*
B*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*B^2*Log[(c
+ d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) - (2*
B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*B^2*Log[(e*(a +
b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)*g*
i) + (2*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)*g*i) + (
2*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*B^2*Pol
yLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)*g*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
```

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
```

```
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(88c+88dx)(ag+bgx)}\,dx = \int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g(c+dx)}\right)dx$$

$$= \frac{b\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{88(bc-ad)g} - \frac{d\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{88(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g} - \frac{B\int \frac{(c+dx)(-\cdots}{\cdots}}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g} - \frac{B\int \frac{(c+dx)(-\cdots}{\cdots}}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g} - \frac{B\int \frac{(bc-ad)e\cdots}{\cdots}}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g} - \frac{B\int \frac{\log(a+bx\cdots}{\cdots}}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g} - \frac{B\int\left(\frac{A\log(\cdots}{(a+bx)(\cdots}\cdots\right.}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{88(bc-ad)g} - \frac{(AB)\int\frac{\log\cdots}{(a+\cdots}}{44\cdots}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc-ad)g} - \frac{\left(A+B\log\left(\frac{e(a\cdots}{c\cdots}\right.\right.}{88(b\cdots}$$

$$= -\frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \frac{\log(a+bx)\left(A+\cdots\right.}{88(bc-\cdots}$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \cdots$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \cdots$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \cdots$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} + \cdots$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} + \frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc-ad)g} - \frac{B\cdots}{\cdots}$$

$$= -\frac{AB\log^2(a+bx)}{88(bc-ad)g} + \frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2\left(\frac{1}{c+dx}\right)}{88(bc-ad)g} - \frac{B^2\cdots}{\cdots}$$

$$\frac{AB\log^2(a+bx)}{\cdots} \quad \frac{B^2\log(a+bx)\log^2\left(\frac{1}{c+dx}\right)}{\cdots} \quad \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2\left(\frac{1}{c+dx}\right)}{\cdots} \quad B^2\cdots$$

Mathematica [A] time = 0.364844, size = 79, normalized size = 1.8

$$\frac{3A^2\log\left(\frac{e(a+bx)}{c+dx}\right)+3AB\log^2\left(\frac{e(a+bx)}{c+dx}\right)+B^2\log^3\left(\frac{e(a+bx)}{c+dx}\right)}{3bcgi-3adgi}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*
x)),x]
```

```
[Out] (3*A^2*Log[(e*(a + b*x))/(c + d*x)] + 3*A*B*Log[(e*(a + b*x))/(c + d*x)]^2
+ B^2*Log[(e*(a + b*x))/(c + d*x)]^3)/(3*b*c*g*i - 3*a*d*g*i)
```

Maple [B] time = 0.054, size = 312, normalized size = 7.1

$$-\frac{A^2ad}{i(ad-bc)^2g}\ln\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)+\frac{A^2bc}{i(ad-bc)^2g}\ln\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)-\frac{dABa}{i(ad-bc)^2g}\left(\ln\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)\right)^2+\frac{}{i(ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] -d/i/(a*d-b*c)^2/g*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/i/(a*d-b*c)^2/g*
A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-d/i/(a*d-b*c)^2/g*A*B*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2*a+1/i/(a*d-b*c)^2/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^2*b*c-1/3*d/i/(a*d-b*c)^2/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a+1/3/i
/(a*d-b*c)^2/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*b*c
```

Maxima [B] time = 1.31962, size = 536, normalized size = 12.18

$$B^2\left(\frac{\log(bx+a)}{(bc-ad)gi}-\frac{\log(dx+c)}{(bc-ad)gi}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)^2+2AB\left(\frac{\log(bx+a)}{(bc-ad)gi}-\frac{\log(dx+c)}{(bc-ad)gi}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{1}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorit
hm="maxima")
```

```
[Out] B^2*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x + c)/((b*c - a*d)*g*i))*log(b
*e*x/(d*x + c) + a*e/(d*x + c))^2 + 2*A*B*(log(b*x + a)/((b*c - a*d)*g*i) -
 log(d*x + c)/((b*c - a*d)*g*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/3
*B^2*(3*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c) + log(d*x + c)^2)*log
(b*e*x/(d*x + c) + a*e/(d*x + c))/(b*c*g*i - a*d*g*i) - (log(b*x + a)^3 - 3
*log(b*x + a)^2*log(d*x + c) + 3*log(b*x + a)*log(d*x + c)^2 - log(d*x + c)
^3)/(b*c*g*i - a*d*g*i)) + A^2*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x +
c)/((b*c - a*d)*g*i)) - (log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c) + log
(d*x + c)^2)*A*B/(b*c*g*i - a*d*g*i)
```

Fricas [B] time = 0.494872, size = 184, normalized size = 4.18

$$\frac{B^2 \log\left(\frac{bex+ae}{dx+c}\right)^3 + 3\,AB\log\left(\frac{bex+ae}{dx+c}\right)^2 + 3\,A^2\log\left(\frac{bex+ae}{dx+c}\right)}{3\,(bc-ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] 1/3*(B^2*log((b*e*x + a*e)/(d*x + c))^3 + 3*A*B*log((b*e*x + a*e)/(d*x + c)
)^2 + 3*A^2*log((b*e*x + a*e)/(d*x + c)))/((b*c - a*d)*g*i)
```

Sympy [B] time = 2.24574, size = 206, normalized size = 4.68

$$A^2\left(\frac{\log\left(x+\frac{-\frac{a^2d^2}{ad-bc}+\frac{2abcd}{ad-bc}+ad-\frac{b^2c^2}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}-\frac{\log\left(x+\frac{\frac{a^2d^2}{ad-bc}-\frac{2abcd}{ad-bc}+ad+\frac{b^2c^2}{ad-bc}+bc}{2bd}\right)}{gi\,(ad-bc)}\right)-\frac{AB\log\left(\frac{e(a+bx)}{c+dx}\right)^2}{adgi-bcgi}-\frac{B^2\log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3adgi-3bcgi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] A**2*(log(x + (-a**2*d**2/(a*d - b*c) + 2*a*b*c*d/(a*d - b*c) + a*d - b**2*
c**2/(a*d - b*c) + b*c)/(2*b*d))/(g*i*(a*d - b*c)) - log(x + (a**2*d**2/(a*
d - b*c) - 2*a*b*c*d/(a*d - b*c) + a*d + b**2*c**2/(a*d - b*c) + b*c)/(2*b*
d))/(g*i*(a*d - b*c))) - A*B*log(e*(a + b*x)/(c + d*x))**2/(a*d*g*i - b*c*g
*i) - B**2*log(e*(a + b*x)/(c + d*x))**3/(3*a*d*g*i - 3*b*c*g*i)
```

Giac [B] time = 1.79133, size = 211, normalized size = 4.8

$$-\frac{B^2 i\log\left(\frac{bx+a}{dx+c}\right)^3}{3\left(bcg-adg\right)}-\frac{\left(ABi+B^2 i\right)\log\left(\frac{bx+a}{dx+c}\right)^2}{bcg-adg}-\frac{\left(A^2 i+2\,ABi+B^2 i\right)\log\left(\left|\frac{2\,bdx+bc+ad-|-bc+ad|}{2\,bdx+bc+ad+|-bc+ad|}\right|\right)}{g|-bc+ad|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] -1/3*B^2*i*log((b*x + a)/(d*x + c))^3/(b*c*g - a*d*g) - (A*B*i + B^2*i)*log
((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - (A^2*i + 2*A*B*i + B^2*i)*log(abs
((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c +
a*d))))/(g*abs(-b*c + a*d))
```

3.89 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=183

$$-\frac{d\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bg^2i(bc-ad)^2}-\frac{b(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i(a+bx)(bc-ad)^2}-\frac{2bB(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i(a+bx)(bc-ad)^2}-\frac{2bB^2(c+dx)}{g^2i(a+bx)(bc-ad)^2}$$

```
[Out] (-2*b*B^2*(c + d*x))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (2*b*B*(c + d*x)*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (b*(c
+ d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*g^2*i*(a + b*
x)) - (d*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^2*g^2*i)
```

Rubi [C] time = 6.33136, antiderivative size = 1684, normalized size of antiderivative = 9.2, number of steps used = 87, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*i*x)),
x]
```

```
[Out] (-2*B^2)/((b*c - a*d)*g^2*i*(a + b*x)) - (2*B^2*d*Log[a + b*x])/((b*c - a*d
)^2*g^2*i) + (A*B*d*Log[a + b*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[a +
b*x]^2)/((b*c - a*d)^2*g^2*i) - (B^2*d*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/
((b*c - a*d)^2*g^2*i) + (B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d
*x)^(-1)]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[-((b*c - a*d)/(d*(a + b*x))
)]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[a + b
*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g^2*i) - (2*B*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)*g^2*i*(a + b*x)) - (2*B*d*Log[a +
b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^2*i) - (A + B*L
og[(e*(a + b*x))/(c + d*x)])^2/((b*c - a*d)*g^2*i*(a + b*x)) - (d*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*g^2*i) + (2*B^2*
d*Log[c + d*x])/((b*c - a*d)^2*g^2*i) - (B^2*d*Log[a + b*x]^2*Log[c + d*x])
/((b*c - a*d)^2*g^2*i) - (2*A*B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
 d*x])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*L
og[c + d*x])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-
1)]*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (2*B^2*d*Log[-((d*(a + b*x))/(b*c
 - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)
])*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (2*B*d*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (d*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (A*B*d*Log[c + d*x]^2)
/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) - (B^
2*d*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[(e*(a +
 b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[c + d*
x]^3)/(3*(b*c - a*d)^2*g^2*i) - (2*A*B*d*Log[a + b*x]*Log[(b*(c + d*x))/(b*
c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[a + b*x]*Log[(b*(c + d*x))/
(b*c - a*d)])/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[a + b*x]^2*Log[(b*(c + d*x
))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*A*B*d*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) + (2*B^2*d*Log[a + b*x]*PolyLog[2, -
```

```
((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) - (2*A*B*d*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[(c + d*x)^(-1)
]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) + (2*B^2*d*(
Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[(e*(a +
 b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2
*g^2*i) - (2*B^2*d*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2
*g^2*i) - (2*B^2*d*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^
2*i) - (2*B^2*d*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g
^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
```

```
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

<u>Rubi steps</u>

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(89c+89dx)(ag+bgx)^2}\,dx = \int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2(c+dx)}\right) d$$

$$= -\frac{(bd)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{89(bc-ad)^2g^2} + \frac{d^2\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{89(bc-ad)^2g^2} + \frac{b\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{89(bc-ad)g^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{89(bc-ad}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{89(bc-ad}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{89(bc-ad}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc-ad)^2g^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{89(bc-ad}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)g^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)^2g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{89(bc-ad)g^2(a+}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)g^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)^2g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{89(bc-ad)g^2(a+}$$

$$= \frac{B^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{89(bc-ad)^2g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc-ad)g^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\right.}{89(bc-ad)^2g^2}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{89(bc-ad)^2g^2} + \frac{B^2d\,l}{}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\,l}{89(bc-ad}$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log^2(a+bx)}{89(bc-ad)^2g^2} +$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log^2(a+bx)}{89(bc-ad)^2g^2} +$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log^2(a+bx)}{89(bc-ad)^2g^2} +$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log^2(a+bx)}{89(bc-ad)^2g^2} -$$

$$= -\frac{2B^2}{89(bc-ad)g^2(a+bx)} - \frac{2B^2d\log(a+bx)}{89(bc-ad)^2g^2} + \frac{ABd\log^2(a+bx)}{89(bc-ad)^2g^2} + \frac{B^2d\log^2(a+bx)}{89(bc-ad)^2g^2} -$$

Mathematica [A] time = 0.663086, size = 186, normalized size = 1.02

$$-\frac{3\left(A^2+2AB+2B^2\right)(-d(a+bx)\log(c+dx)-ad+bc)+3d\left(A^2+2AB+2B^2\right)(a+bx)\log(a+bx)+3B(aAd+Ab}{3g^2i(a+bx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*
i*x)),x]
```

```
[Out] -(3*(A^2 + 2*A*B + 2*B^2)*d*(a + b*x)*Log[a + b*x] + 6*B*(A + B)*(b*c - a*d
)*Log[(e*(a + b*x))/(c + d*x)] + 3*B*(a*A*d + A*b*d*x + b*B*(c + d*x))*Log[
(e*(a + b*x))/(c + d*x)]^2 + B^2*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^3
 + 3*(A^2 + 2*A*B + 2*B^2)*(b*c - a*d - d*(a + b*x)*Log[c + d*x]))/(3*(b*c
- a*d)^2*g^2*i*(a + b*x))
```

Maple [B] time = 0.054, size = 1201, normalized size = 6.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] -d^2/i/(a*d-b*c)^3/g^2*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d/i/(a*d-b*c)^
3/g^2*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-e*d/i/(a*d-b*c)^3/g^2*A^2*b/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e/i/(a*d-b*c)^3/g^2*A^2*b^2/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)*c-d^2/i/(a*d-b*c)^3/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2*a+d/i/(a*d-b*c)^3/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*
c-2*e*d/i/(a*d-b*c)^3/g^2*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*a+2*e/i/(a*d-b*c)^3/g^2*A*B*b^2/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d/i/(a*d-b*c)^3/g^2
*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e/i/(a*d-b*c)^3/g^2*A*B*b^2/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-1/3*d^2/i/(a*d-b*c)^3/g^2*B^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^3*a+1/3*d/i/(a*d-b*c)^3/g^2*B^2*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^3*b*c-e*d/i/(a*d-b*c)^3/g^2*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+e/i/(a*d-b*c)^3/g^2*B^2*b^2/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-2*e*d
/i/(a*d-b*c)^3/g^2*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*a+2*e/i/(a*d-b*c)^3/g^2*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d
*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d/i/(a*d-b*c)^3/g^2*B^2*b/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e/i/(a*d-b*c)^3/g^2*B^2*b^2/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c
```

Maxima [B] time = 1.53342, size = 1361, normalized size = 7.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] -B^2*(1/((b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/
((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*
c*d + a^2*d^2)*g^2*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 - 2*A*B*(1/((
b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^2
- 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*
d^2)*g^2*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1/3*B^2*(3*((b*d*x + a*
d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x
 + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))*log(d*x
 + c))*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*
g^2*i + a^3*d^2*g^2*i + (b^3*c^2*g^2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*
i)*x) - ((b*d*x + a*d)*log(b*x + a)^3 - (b*d*x + a*d)*log(d*x + c)^3 - 3*(b
*d*x + a*d)*log(b*x + a)^2 - 3*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))*l
og(d*x + c)^2 + 6*b*c - 6*a*d + 6*(b*d*x + a*d)*log(b*x + a) - 3*(2*b*d*x +
 (b*d*x + a*d)*log(b*x + a)^2 + 2*a*d - 2*(b*d*x + a*d)*log(b*x + a))*log(d
*x + c))/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*d^2*g^2*i + (b^3*c^2*g^
2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*i)*x)) - A^2*(1/((b^2*c - a*b*d)*g^
2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2
*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i)) + ((
b*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d
- 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a
))*log(d*x + c))*A*B/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*d^2*g^2*i +
 (b^3*c^2*g^2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*i)*x)
```

Fricas [A] time = 0.521856, size = 512, normalized size = 2.8

$$-\frac{\left(B^2bdx + B^2ad\right)\log\left(\frac{bex+ae}{dx+c}\right)^3 + 3\left(A^2 + 2\,AB + 2\,B^2\right)bc - 3\left(A^2 + 2\,AB + 2\,B^2\right)ad + 3\left(B^2bc + ABad + \left(AB + B^2\right)bdx\right)}{3\left(\left(b^3c^2 - 2\,ab^2cd + a^2bd^2\right)g^2ix + \left(ab^2c^2 - 2\,a^2bcd\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] -1/3*((B^2*b*d*x + B^2*a*d)*log((b*e*x + a*e)/(d*x + c))^3 + 3*(A^2 + 2*A*B
 + 2*B^2)*b*c - 3*(A^2 + 2*A*B + 2*B^2)*a*d + 3*(B^2*b*c + A*B*a*d + (A*B +
 B^2)*b*d*x)*log((b*e*x + a*e)/(d*x + c))^2 + 3*(A^2*a*d + (A^2 + 2*A*B + 2
*B^2)*b*d*x + 2*(A*B + B^2)*b*c)*log((b*e*x + a*e)/(d*x + c)))/((b^3*c^2 -
2*a*b^2*c*d + a^2*b*d^2)*g^2*i*x + (a*b^2*c^2 - 2*a^2*b*c*d + a^3*d^2)*g^2*
i)
```

Sympy [B] time = 4.5508, size = 541, normalized size = 2.96

$$-\frac{B^2d\log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3a^2d^2g^2i - 6abcdg^2i + 3b^2c^2g^2i} + \frac{\left(2AB + 2B^2\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}{a^2dg^2i - abcg^2i + abdg^2ix - b^2cg^2ix} + \left(A^2 + 2AB + 2B^2\right)\left(\frac{d\log\left(x + \frac{-\frac{a^3d^4}{(ad-bc)^2} + \frac{3a^2bcd^3}{(ad-bc)^2}}{\cdots}\right.}{g^2i\,(ad}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2/(d*i*x+c*i),x)
```

```
[Out] -B**2*d*log(e*(a + b*x)/(c + d*x))**3/(3*a**2*d**2*g**2*i - 6*a*b*c*d*g**2*
i + 3*b**2*c**2*g**2*i) + (2*A*B + 2*B**2)*log(e*(a + b*x)/(c + d*x))/(a**2
*d*g**2*i - a*b*c*g**2*i + a*b*d*g**2*i*x - b**2*c*g**2*i*x) + (A**2 + 2*A*
B + 2*B**2)*(d*log(x + (-a**3*d**4/(a*d - b*c)**2 + 3*a**2*b*c*d**3/(a*d -
b*c)**2 - 3*a*b**2*c**2*d**2/(a*d - b*c)**2 + a*d**2 + b**3*c**3*d/(a*d - b
*c)**2 + b*c*d)/(2*b*d**2))/(g**2*i*(a*d - b*c)**2) - d*log(x + (a**3*d**4/
(a*d - b*c)**2 - 3*a**2*b*c*d**3/(a*d - b*c)**2 + 3*a*b**2*c**2*d**2/(a*d -
 b*c)**2 + a*d**2 - b**3*c**3*d/(a*d - b*c)**2 + b*c*d)/(2*b*d**2))/(g**2*i
*(a*d - b*c)**2) + 1/(a**2*d*g**2*i - a*b*c*g**2*i + x*(a*b*d*g**2*i - b**2
*c*g**2*i))) + (-A*B*a*d - A*B*b*d*x - B**2*b*c - B**2*b*d*x)*log(e*(a + b*
x)/(c + d*x))**2/(a**3*d**2*g**2*i - 2*a**2*b*c*d*g**2*i + a**2*b*d**2*g**2
*i*x + a*b**2*c**2*g**2*i - 2*a*b**2*c*d*g**2*i*x + b**3*c**2*g**2*i*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^2(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^2*(d*i*x + c*
i)), x)
```

3.90 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=343

$$-\frac{b^2(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3i(a+bx)^2(bc-ad)^3}-\frac{b^2B(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3}+\frac{d^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bg^3i(bc-ad)^3}+\frac{2bd(c+dx)\left(B\log\right.}{g^3i(a+bx)}$$

```
[Out] (4*b*B^2*d*(c + d*x))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B^2*(c + d*x)^
2)/(4*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (4*b*B*d*(c + d*x)*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B*(c + d*x)^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2)
+ (2*b*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g
^3*i*(a + b*x)) - (b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (d^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^3)/(3*B*(b*c - a*d)^3*g^3*i)
```

Rubi [C] time = 7.36569, antiderivative size = 1899, normalized size of antiderivative = 5.54, number of steps used = 117, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*i*x)),
x]
```

```
[Out] -B^2/(4*(b*c - a*d)*g^3*i*(a + b*x)^2) + (7*B^2*d)/(2*(b*c - a*d)^2*g^3*i*(
a + b*x)) + (7*B^2*d^2*Log[a + b*x])/(2*(b*c - a*d)^3*g^3*i) - (A*B*d^2*Log
[a + b*x]^2)/((b*c - a*d)^3*g^3*i) - (3*B^2*d^2*Log[a + b*x]^2)/(2*(b*c - a
*d)^3*g^3*i) + (B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^3*
g^3*i) - (B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/
((b*c - a*d)^3*g^3*i) - (B^2*d^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(
a + b*x))/(c + d*x)]^2)/((b*c - a*d)^3*g^3*i) - (B^2*d^2*Log[a + b*x]*Log[(
e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^3*g^3*i) - (B*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(2*(b*c - a*d)*g^3*i*(a + b*x)^2) + (3*B*d*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g^3*i*(a + b*x)) + (3*B*d^2*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^3*i) - (A + B*Lo
g[(e*(a + b*x))/(c + d*x)])^2/(2*(b*c - a*d)*g^3*i*(a + b*x)^2) + (d*(A + B
*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*g^3*i*(a + b*x)) + (d^2*Lo
g[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^3*i) -
(7*B^2*d^2*Log[c + d*x])/(2*(b*c - a*d)^3*g^3*i) + (B^2*d^2*Log[a + b*x]^2*
Log[c + d*x])/((b*c - a*d)^3*g^3*i) + (2*A*B*d^2*Log[-((d*(a + b*x))/(b*c -
 a*d))]*Log[c + d*x])/((b*c - a*d)^3*g^3*i) + (3*B^2*d^2*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*Log[a + b*
x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b*c - a*d)^3*g^3*i) - (2*B^2*d^2*Log
[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e
*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^3*g^3*i) - (3*B*d^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^3*g^3*i) - (d^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^3*g^3*i)
 - (A*B*d^2*Log[c + d*x]^2)/((b*c - a*d)^3*g^3*i) - (3*B^2*d^2*Log[c + d*x]
^2)/(2*(b*c - a*d)^3*g^3*i) + (B^2*d^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c -
```

```
 a*d)^3*g^3*i) - (B^2*d^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*
c - a*d)^3*g^3*i) - (B^2*d^2*Log[c + d*x]^3)/(3*(b*c - a*d)^3*g^3*i) + (2*A
*B*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) +
 (3*B^2*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3
*i) - (B^2*d^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^
3*g^3*i) + (2*A*B*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d
)^3*g^3*i) + (3*B^2*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a
*d)^3*g^3*i) - (2*B^2*d^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/((b*c - a*d)^3*g^3*i) + (2*A*B*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])/((b*c - a*d)^3*g^3*i) + (3*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) - (2*B^2*d^2*(Log[a + b*x] + L
og[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*Log[(e*(a + b*x))/(c + d*
x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^3*i) + (2*B
^2*d^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^3*i) + (2
*B^2*d^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) + (2*
B^2*d^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(90c+90dx)(ag+bgx)^3}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)g^3(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)^2} + \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^3g^3(a+bx)} - \cdots$$

$$= \frac{\left(bd^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{90(bc-ad)^3g^3} - \frac{d^3\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{90(bc-ad)^3g^3} - \frac{(bd)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{90(bc-ad)^2g^3} + \cdots$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\cdots\right)\right)}{90(bc-ad)^3g^3}\cdots$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\cdots\right)\right)}{90(bc-ad)^3g^3}\cdots$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\cdots\right)\right)}{90(bc-ad)^3g^3}\cdots$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\cdots\right)\right)}{90(bc-ad)^3g^3}\cdots$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc-ad)g^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc-ad)^2g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\log\left(\cdots\right)\right)}{30(bc-ad)^3g^3}\cdots$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc-ad)g^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc-ad)^2g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\log\left(\cdots\right)\right)}{30(bc-ad)^3g^3}\cdots$$

$$= -\frac{B^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{90(bc-ad)^3g^3} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc-ad)g^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc-ad)^2g^3(a+bx)}\cdots$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+bx)}{180(bc-ad)^3g^3} - \frac{B^2d^2\log\left(\cdots\right)}{9\cdots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+bx)}{180(bc-ad)^3g^3} - \frac{ABd^2\log^2\cdots}{90(bc-\cdots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+bx)}{180(bc-ad)^3g^3} - \frac{ABd^2\log^2\cdots}{90(bc-\cdots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+bx)}{180(bc-ad)^3g^3} - \frac{ABd^2\log^2\cdots}{90(bc-\cdots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+bx)}{180(bc-ad)^3g^3} - \frac{ABd^2\log^2\cdots}{90(bc-\cdots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+bx)}{180(bc-ad)^3g^3} - \frac{ABd^2\log^2\cdots}{90(bc-\cdots}$$

$$= -\frac{B^2}{360(bc-ad)g^3(a+bx)^2} + \frac{7B^2d}{180(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2\log(a+bx)}{180(bc-ad)^3g^3} - \frac{ABd^2\log^2\cdots}{90(bc-\cdots}$$

Mathematica [A] time = 1.13258, size = 318, normalized size = 0.93

$$-6B\left(-2a^2Ad^2-4abd(Adx+B(c+dx))+b^2\left(B\left(c^2-2cdx-3d^2x^2\right)-2Ad^2x^2\right)\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)-6d^2\left(2A^2+6AB+7\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*
i*x)),x]
```

```
[Out] (-3*(2*A^2 + 2*A*B + B^2)*(b*c - a*d)^2 + 6*(2*A^2 + 6*A*B + 7*B^2)*d*(b*c
- a*d)*(a + b*x) + 6*(2*A^2 + 6*A*B + 7*B^2)*d^2*(a + b*x)^2*Log[a + b*x] -
 6*B*(b*c - a*d)*(-6*a*A*d - 7*a*B*d + b*B*(c - 6*d*x) + 2*A*b*(c - 2*d*x))
*Log[(e*(a + b*x))/(c + d*x)] - 6*B*(-2*a^2*A*d^2 - 4*a*b*d*(A*d*x + B*(c +
 d*x)) + b^2*(-2*A*d^2*x^2 + B*(c^2 - 2*c*d*x - 3*d^2*x^2)))*Log[(e*(a + b*
x))/(c + d*x)]^2 + 4*B^2*d^2*(a + b*x)^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 6
*(2*A^2 + 6*A*B + 7*B^2)*d^2*(a + b*x)^2*Log[c + d*x])/(12*(b*c - a*d)^3*g^
3*i*(a + b*x)^2)
```

Maple [B] time = 0.059, size = 2144, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] -1/3*d^3/i/(a*d-b*c)^4/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a+4*e*d/i/
(a*d-b*c)^4/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*c-2*e*d^2/i/(a*d-b*c)^4/g^3*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)*a-1/2*e^2/i/(a*d-b*c)^4/g^3*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/2*e^2/i/(a*d-b*c)^4/g^3*B^
2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*c-d^3/i/(a*d-b*c)^4/g^3*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/2*e^2*d/i/
(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*a+1/2*e^2*d/i/(a*d-b*c)^4/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^2*a-4*e*d^2/i/(a*d-b*c)^4/g^3*A*B*b/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)*a+4*e*d/i/(a*d-b*c)^4/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)*c-e^2/i/(a*d-b*c)^4/g^3*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d^2/i/(a*d-b*c)^4/g^3*B^2*b/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*e*d/i
/(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2*c-4*e*d^2/i/(a*d-b*c)^4/g^3*B^2*b/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*e*d/i/(a*d-b*c)^4/g^3*B^
2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c
+1/2*e^2*d/i/(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+4*e*d/i/(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-1/2*e^2/i/(a*d-b*c)^4/g^3*A*B*b^3/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-4*e*d^2/i/(a*d-b*c)^4/g^3*B^2*b/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)*a+1/2*e^2*d/i/(a*d-b*c)^4/g^3*A^2*b^2/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^2*a+1/4*e^2*d/i/(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*a+2*e*d/i/(a*d-b*c)^4/g^3*A^2*b^2/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)*c+e^2*d/i/(a*d-b*c)^4/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4*e*d^2/i/(a*d-b*c)^4/g^
3*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*a-d^3/i/(a*d-b*c)^4/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*e^2/i/
```

```
(a*d-b*c)^4/g^3*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+d^2/i/(a*d-
b*c)^4/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1/3*d^2/i/(a*d-b*c)^4/
g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*b*c+d^2/i/(a*d-b*c)^4/g^3*A^2*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/4*e^2/i/(a*d-b*c)^4/g^3*B^2*b^3/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c
```

Maxima [B] time = 2.12, size = 2855, normalized size = 8.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] 1/2*B^2*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 -
 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(b*e*x/(d*x + c) + a*e/(d*x
+ c))^2 + A*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^
2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2
*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 -
 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(b*e*x/(d*x + c) + a*e
/(d*x + c)) - 1/12*B^2*(6*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2
 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a
^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d
^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 -
 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))*log(b*
e*x/(d*x + c) + a*e/(d*x + c))/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i +
 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i
 + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*
a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x) + (3*b^2*
c^2 - 48*a*b*c*d + 45*a^2*d^2 - 4*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log
(b*x + a)^3 + 4*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^3 + 18*(
b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 6*(3*b^2*d^2*x^2 + 6*
a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a
))*log(d*x + c)^2 - 42*(b^2*c*d - a*b*d^2)*x - 42*(b^2*d^2*x^2 + 2*a*b*d^2*
x + a^2*d^2)*log(b*x + a) + 6*(7*b^2*d^2*x^2 + 14*a*b*d^2*x + 7*a^2*d^2 + 2
*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 - 6*(b^2*d^2*x^2 + 2*
a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^3*g^3*i - 3*a^3
*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3
*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*
b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g
^3*i)*x)) + 1/2*A^2*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*
b^2*d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a
^2*b^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 -
 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3
*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i)) - 1/2*(b^2*c^2 - 8*
a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^
2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a
*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2
*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2
)*log(b*x + a))*log(d*x + c))*A*B/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*
i + 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^
3*i + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i -
```

```
3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x)
```

Fricas [A] time = 0.527888, size = 1130, normalized size = 3.29

$$-\frac{3\left(2A^2+2AB+B^2\right)b^2c^2-24\left(A^2+2AB+2B^2\right)abcd+3\left(6A^2+14AB+15B^2\right)a^2d^2-4\left(B^2b^2d^2x^2+2B^2abd^2x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] -1/12*(3*(2*A^2 + 2*A*B + B^2)*b^2*c^2 - 24*(A^2 + 2*A*B + 2*B^2)*a*b*c*d +
 3*(6*A^2 + 14*A*B + 15*B^2)*a^2*d^2 - 4*(B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x
 + B^2*a^2*d^2)*log((b*e*x + a*e)/(d*x + c))^3 - 6*((2*A*B + 3*B^2)*b^2*d^2
*x^2 - B^2*b^2*c^2 + 4*B^2*a*b*c*d + 2*A*B*a^2*d^2 + 2*(B^2*b^2*c*d + 2*(A*
B + B^2)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 6*((2*A^2 + 6*A*B + 7
*B^2)*b^2*c*d - (2*A^2 + 6*A*B + 7*B^2)*a*b*d^2)*x - 6*((2*A^2 + 6*A*B + 7*
B^2)*b^2*d^2*x^2 + 2*A^2*a^2*d^2 - (2*A*B + B^2)*b^2*c^2 + 8*(A*B + B^2)*a*
b*c*d + 2*((2*A*B + 3*B^2)*b^2*c*d + 2*(A^2 + 2*A*B + 2*B^2)*a*b*d^2)*x)*lo
g((b*e*x + a*e)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a
^3*b^2*d^3)*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 -
a^4*b*d^3)*g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d
^3)*g^3*i)
```

Sympy [B] time = 12.3273, size = 1488, normalized size = 4.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] -B**2*d**2*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g**3*i - 9*a**2*b*c*d
**2*g**3*i + 9*a*b**2*c**2*d*g**3*i - 3*b**3*c**3*g**3*i) + d**2*(2*A**2 +
6*A*B + 7*B**2)*log(x + (2*A**2*a*d**3 + 2*A**2*b*c*d**2 + 6*A*B*a*d**3 + 6
*A*B*b*c*d**2 + 7*B**2*a*d**3 + 7*B**2*b*c*d**2 - a**4*d**6*(2*A**2 + 6*A*B
 + 7*B**2)/(a*d - b*c)**3 + 4*a**3*b*c*d**5*(2*A**2 + 6*A*B + 7*B**2)/(a*d
- b*c)**3 - 6*a**2*b**2*c**2*d**4*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3
+ 4*a*b**3*c**3*d**3*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 - b**4*c**4*d
**2*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b*d**3 + 12*A*B*b*d**
3 + 14*B**2*b*d**3))/(2*g**3*i*(a*d - b*c)**3) - d**2*(2*A**2 + 6*A*B + 7*B
**2)*log(x + (2*A**2*a*d**3 + 2*A**2*b*c*d**2 + 6*A*B*a*d**3 + 6*A*B*b*c*d*
*2 + 7*B**2*a*d**3 + 7*B**2*b*c*d**2 + a**4*d**6*(2*A**2 + 6*A*B + 7*B**2)/
(a*d - b*c)**3 - 4*a**3*b*c*d**5*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 +
 6*a**2*b**2*c**2*d**4*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 - 4*a*b**3*
c**3*d**3*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 + b**4*c**4*d**2*(2*A**2
 + 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b*d**3 + 12*A*B*b*d**3 + 14*B**2
*b*d**3))/(2*g**3*i*(a*d - b*c)**3) + (6*A*B*a*d - 2*A*B*b*c + 4*A*B*b*d*x
+ 7*B**2*a*d - B**2*b*c + 6*B**2*b*d*x)*log(e*(a + b*x)/(c + d*x))/(2*a**4*
d**2*g**3*i - 4*a**3*b*c*d*g**3*i + 4*a**3*b*d**2*g**3*i*x + 2*a**2*b**2*c*
*2*g**3*i - 8*a**2*b**2*c*d*g**3*i*x + 2*a**2*b**2*d**2*g**3*i*x**2 + 4*a*b
**3*c**2*g**3*i*x - 4*a*b**3*c*d*g**3*i*x**2 + 2*b**4*c**2*g**3*i*x**2) + (
```

```
-2*A*B*a**2*d**2 - 4*A*B*a*b*d**2*x - 2*A*B*b**2*d**2*x**2 - 4*B**2*a*b*c*d
 - 4*B**2*a*b*d**2*x + B**2*b**2*c**2 - 2*B**2*b**2*c*d*x - 3*B**2*b**2*d**
2*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**5*d**3*g**3*i - 6*a**4*b*c*d**2
*g**3*i + 4*a**4*b*d**3*g**3*i*x + 6*a**3*b**2*c**2*d*g**3*i - 12*a**3*b**2
*c*d**2*g**3*i*x + 2*a**3*b**2*d**3*g**3*i*x**2 - 2*a**2*b**3*c**3*g**3*i +
 12*a**2*b**3*c**2*d*g**3*i*x - 6*a**2*b**3*c*d**2*g**3*i*x**2 - 4*a*b**4*c
**3*g**3*i*x + 6*a*b**4*c**2*d*g**3*i*x**2 - 2*b**5*c**3*g**3*i*x**2) + (6*
A**2*a*d - 2*A**2*b*c + 14*A*B*a*d - 2*A*B*b*c + 15*B**2*a*d - B**2*b*c + x
*(4*A**2*b*d + 12*A*B*b*d + 14*B**2*b*d))/(4*a**4*d**2*g**3*i - 8*a**3*b*c*
d*g**3*i + 4*a**2*b**2*c**2*g**3*i + x**2*(4*a**2*b**2*d**2*g**3*i - 8*a*b*
*3*c*d*g**3*i + 4*b**4*c**2*g**3*i) + x*(8*a**3*b*d**2*g**3*i - 16*a**2*b**
2*c*d*g**3*i + 8*a*b**3*c**2*g**3*i))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^3(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^3*(d*i*x + c*
i)), x)
```

3.91 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=507

$$-\frac{b^3(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4i(a+bx)^3(bc-ad)^4}-\frac{2b^3B(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2d(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^4i(a+bx)^2(bc-ad)^4}+\cdots$$

```
[Out] (-6*b*B^2*d^2*(c + d*x))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B^2*d*(c
+ d*x)^2)/(4*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (2*b^3*B^2*(c + d*x)^3)/(27
*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (6*b*B*d^2*(c + d*x)*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B*d*(c + d*x)^
2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^4*i*(a + b*x)^2)
 - (2*b^3*B*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d
)^4*g^4*i*(a + b*x)^3) - (3*b*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*d*(c + d*x)^2*(A + B*Log[
(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (b^3*(c
+ d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^4*g^4*i*(a
+ b*x)^3) - (d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^4
*g^4*i)
```

Rubi [C] time = 8.43056, antiderivative size = 2044, normalized size of antiderivative = 4.03, number of steps used = 151, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*i*x)),
x]
```

```
[Out] (-2*B^2)/(27*(b*c - a*d)*g^4*i*(a + b*x)^3) + (19*B^2*d)/(36*(b*c - a*d)^2*
g^4*i*(a + b*x)^2) - (85*B^2*d^2)/(18*(b*c - a*d)^3*g^4*i*(a + b*x)) - (85*
B^2*d^3*Log[a + b*x])/(18*(b*c - a*d)^4*g^4*i) + (A*B*d^3*Log[a + b*x]^2)/(
(b*c - a*d)^4*g^4*i) + (11*B^2*d^3*Log[a + b*x]^2)/(6*(b*c - a*d)^4*g^4*i)
- (B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^4*g^4*i) + (B^2
*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^
4*g^4*i) + (B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c
+ d*x)]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[a + b*x]*Log[(e*(a + b*x))/
(c + d*x)]^2)/((b*c - a*d)^4*g^4*i) - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(9*(b*c - a*d)*g^4*i*(a + b*x)^3) + (5*B*d*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(6*(b*c - a*d)^2*g^4*i*(a + b*x)^2) - (11*B*d^2*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^3*g^4*i*(a + b*x)) - (11*B*d^3*Log[a
+ b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^4*g^4*i) - (A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2/(3*(b*c - a*d)*g^4*i*(a + b*x)^3) + (d*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^2*g^4*i*(a + b*x)^2)
- (d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^4*i*(a + b*
x)) - (d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d
)^4*g^4*i) + (85*B^2*d^3*Log[c + d*x])/(18*(b*c - a*d)^4*g^4*i) - (B^2*d^3*
Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^4*g^4*i) - (2*A*B*d^3*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^4*i) - (11*B^2*d^3*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*(b*c - a*d)^4*g^4*i) - (2*
```

```
B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b*c - a*d)^4*g^4*i
) + (2*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d
*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^4*g^4*
i) + (11*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*(b*c -
 a*d)^4*g^4*i) + (d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/
((b*c - a*d)^4*g^4*i) + (A*B*d^3*Log[c + d*x]^2)/((b*c - a*d)^4*g^4*i) + (1
1*B^2*d^3*Log[c + d*x]^2)/(6*(b*c - a*d)^4*g^4*i) - (B^2*d^3*Log[a + b*x]*L
og[c + d*x]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[(e*(a + b*x))/(c + d*x)
]*Log[c + d*x]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[c + d*x]^3)/(3*(b*c
- a*d)^4*g^4*i) - (2*A*B*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
(b*c - a*d)^4*g^4*i) - (11*B^2*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*
d)])/(3*(b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[a + b*x]^2*Log[(b*(c + d*x))/(b
*c - a*d)])/((b*c - a*d)^4*g^4*i) - (2*A*B*d^3*PolyLog[2, -((d*(a + b*x))/(
b*c - a*d))])/((b*c - a*d)^4*g^4*i) - (11*B^2*d^3*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))])/(3*(b*c - a*d)^4*g^4*i) + (2*B^2*d^3*Log[a + b*x]*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^4*i) - (2*A*B*d^3*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) - (11*B^2*d^3*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/(3*(b*c - a*d)^4*g^4*i) - (2*B^2*d^3*Log[(
c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i)
 + (2*B^2*d^3*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c +
d*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) - (2*B^
2*d^3*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))
])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*PolyLog[3, -((d*(a + b*x))/(b*c - a*d
))])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d
)])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b
*x))])/((b*c - a*d)^4*g^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
```

```
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
```

```
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(91c+91dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)^3g^4(a+bx)^2}\right.$$

$$= -\frac{\left(bd^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{91(bc-ad)^4g^4} + \frac{d^4\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{91(bc-ad)^4g^4} + \frac{\left(bd^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}}{91(bc-ad)^3g^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)^3g^4(a+bx)} -$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)^3g^4(a+bx)} -$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)^3g^4(a+bx)} -$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc-ad)^3g^4(a+bx)} -$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc-ad)g^4(a+bx)^3} + \frac{5Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{273(bc-ad)^3g^4(a+bx)}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc-ad)g^4(a+bx)^3} + \frac{5Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{273(bc-ad)^3g^4(a+bx)}$$

$$= \frac{B^2d^3\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{91(bc-ad)^4g^4} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc-ad)g^4(a+bx)^3} + \frac{5Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc-ad)^2g^4(a+bx)}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2}{1638(bc-ad)^3g^4(a+bx)}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2}{1638(bc-ad)^3g^4(a+bx)}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2}{1638(bc-ad)^3g^4(a+bx)}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2}{1638(bc-ad)^3g^4(a+bx)}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2}{1638(bc-ad)^3g^4(a+bx)}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2}{1638(bc-ad)^3g^4(a+bx)}$$

$$= -\frac{2B^2}{2457(bc-ad)g^4(a+bx)^3} + \frac{19B^2d}{3276(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2}{1638(bc-ad)^3g^4(a+bx)}$$

Mathematica [A] time = 1.46497, size = 442, normalized size = 0.87

$$-\frac{18B\left(18a^2bd^2(Adx+B(c+dx))+6a^3Ad^3+9ab^2d\left(2Ad^2x^2+B\left(-c^2+2cdx+3d^2x^2\right)\right)+b^3\left(6Ad^3x^3+B\left(-3c^2dx+2c\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*
i*x)),x]
```

```
[Out] -(4*(9*A^2 + 6*A*B + 2*B^2)*(b*c - a*d)^3 - 3*(18*A^2 + 30*A*B + 19*B^2)*d*
(b*c - a*d)^2*(a + b*x) - 6*(18*A^2 + 66*A*B + 85*B^2)*d^2*(-(b*c) + a*d)*(
a + b*x)^2 + 6*(18*A^2 + 66*A*B + 85*B^2)*d^3*(a + b*x)^3*Log[a + b*x] + 6*
B*(b*c - a*d)*(4*(3*A + B)*(b*c - a*d)^2 + 3*(6*A + 5*B)*d*(-(b*c) + a*d)*(
a + b*x) + 6*(6*A + 11*B)*d^2*(a + b*x)^2)*Log[(e*(a + b*x))/(c + d*x)] + 1
8*B*(6*a^3*A*d^3 + 18*a^2*b*d^2*(A*d*x + B*(c + d*x)) + 9*a*b^2*d*(2*A*d^2*
x^2 + B*(-c^2 + 2*c*d*x + 3*d^2*x^2)) + b^3*(6*A*d^3*x^3 + B*(2*c^3 - 3*c^2
*d*x + 6*c*d^2*x^2 + 11*d^3*x^3)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 36*B^2*
d^3*(a + b*x)^3*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*(18*A^2 + 66*A*B + 85*B^
2)*d^3*(a + b*x)^3*Log[c + d*x])/(108*(b*c - a*d)^4*g^4*i*(a + b*x)^3)
```

Maple [B] time = 0.059, size = 3093, normalized size = 6.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] 1/3*e^3/i/(a*d-b*c)^5/g^4*A^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-6
*e*d^3/i/(a*d-b*c)^5/g^4*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+6*e*d^
2/i/(a*d-b*c)^5/g^4*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-2/9*e^3*d
/i/(a*d-b*c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*a+3/2*e^2*d^2/i/(a*d-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-3/2*e^2*d/i/(a
*d-b*c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2*c+3/2*e^2*d^2/i/(a*d-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-3/2*e^2*d/i/(a*d-b*
c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*c-1/3*e^3*d/i/(a*d-b*c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d
*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-3*e*d^3/i/(a*d-b*c)^5/g^4*
B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2
*a+3*e*d^2/i/(a*d-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-6*e*d^3/i/(a*d-b*c)^5/g^4*B^2*b/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+6*e*d^2/i/(a*d
-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*c+2/3*e^3/i/(a*d-b*c)^5/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+3/2*e^2*d^2/i/(a*d-b*c)^5/g^4
*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-3/2*e^2*d/i/(a*d-b*c)^5/g^
4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-2/9*e^3*d/i/(a*d-b*c)^5/g
^4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-3/4*e^2*d/i/(a*d-b*c)^5/
g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-2/27*e^3*d/i/(a*d-b*c)^
5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+3/2*e^2*d^2/i/(a*d-b*
c)^5/g^4*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-3/2*e^2*d/i/(a*d-b
*c)^5/g^4*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/3*e^3*d/i/(a*d-
b*c)^5/g^4*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+2/9*e^3/i/(a*d-b
```

```
*c)^5/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*c+d^3/i/(a*d-b*c)^5/g^4*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*
b*c+1/3*e^3/i/(a*d-b*c)^5/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/3*d^4/i/(a*d-b*c)^5/g^4*B^2*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^3*a-d^4/i/(a*d-b*c)^5/g^4*A^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*a-3*e*d^3/i/(a*d-b*c)^5/g^4*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)*a+3*e*d^2/i/(a*d-b*c)^5/g^4*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)*c-6*e*d^3/i/(a*d-b*c)^5/g^4*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+
2/9*e^3/i/(a*d-b*c)^5/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+6
*e*d^2/i/(a*d-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3/4*
e^2*d^2/i/(a*d-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+2
/27*e^3/i/(a*d-b*c)^5/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-d
^4/i/(a*d-b*c)^5/g^4*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/3*d^3/i/(a*d
-b*c)^5/g^4*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*b*c-2/3*e^3*d/i/(a*d-b*c)
^5/g^4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*a-3*e^2*d/i/(a*d-b*c)^5/g^4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+3*e^2*d^2/i/(a*d-b*c)^5/g^4*A*B*
b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a
-6*e*d^3/i/(a*d-b*c)^5/g^4*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*a+6*e*d^2/i/(a*d-b*c)^5/g^4*A*B*b^2/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+d^3/i/(a*d-b*c)^5/
g^4*A^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c
```

Maxima [B] time = 2.77982, size = 4636, normalized size = 9.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, algor
ithm="maxima")

[Out] -1/6*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
- 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*
g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)
*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3
)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i
) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^
3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d
+ 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*log(b*e*x/(d*x + c)
+ a*e/(d*x + c))^2 - 1/3*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a
^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c
*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*
c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b
^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*
d^2 - a^6*d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^
2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*
c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*
log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/108*B^2*(6*(4*b^3*c^3 - 27*a*b^2*c
^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(
b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 1
8*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2
- 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a
*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 +
33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d
^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))*log(b*e*x/(d*
x + c) + a*e/(d*x + c))/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*
```

```
b^2*c^2*d^2*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i -
4*a*b^6*c^3*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4
*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^
4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b
^5*c^4*g^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*
c*d^3*g^4*i + a^6*b*d^4*g^4*i)*x) + (8*b^3*c^3 - 81*a*b^2*c^2*d + 648*a^2*b
*c*d^2 - 575*a^3*d^3 + 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x +
a^3*d^3)*log(b*x + a)^3 - 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x
 + a^3*d^3)*log(d*x + c)^3 + 510*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 198*(b^3*d^3
*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(11*b
^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^
3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c)^2
 - 3*(19*b^3*c^2*d - 378*a*b^2*c*d^2 + 359*a^2*b*d^3)*x + 510*(b^3*d^3*x^3
+ 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(85*b^3*d^3*x
^3 + 255*a*b^2*d^3*x^2 + 255*a^2*b*d^3*x + 85*a^3*d^3 + 18*(b^3*d^3*x^3 + 3
*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 66*(b^3*d^3*x^3
+ 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a
^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i - 4*a^6*
b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*i + 6*a^
2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a
*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^
3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i - 4*a^3*b^4*c
^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i + a^6*b*d^4*g^
4*i)*x)) - 1/6*A^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3
*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3
*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^
4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 -
 a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*
d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*
d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*
b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i)) - 1/18*(4*
b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a
*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3
)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*
d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 6
6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) -
6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3
*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x
 + c))*A*B/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g
^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d
*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*
i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4
*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i
- 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i +
 a^6*b*d^4*g^4*i)*x)
```

Fricas [A] time = 0.602219, size = 1991, normalized size = 3.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] -1/108*(4*(9*A^2 + 6*A*B + 2*B^2)*b^3*c^3 - 81*(2*A^2 + 2*A*B + B^2)*a*b^2*
c^2*d + 324*(A^2 + 2*A*B + 2*B^2)*a^2*b*c*d^2 - (198*A^2 + 510*A*B + 575*B^
```

```
2)*a^3*d^3 + 36*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x
+ B^2*a^3*d^3)*log((b*e*x + a*e)/(d*x + c))^3 + 6*((18*A^2 + 66*A*B + 85*B^
2)*b^3*c*d^2 - (18*A^2 + 66*A*B + 85*B^2)*a*b^2*d^3)*x^2 + 18*((6*A*B + 11*
B^2)*b^3*d^3*x^3 + 2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b*c*d^2 +
 6*A*B*a^3*d^3 + 3*(2*B^2*b^3*c*d^2 + 3*(2*A*B + 3*B^2)*a*b^2*d^3)*x^2 - 3*
(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 - 6*(A*B + B^2)*a^2*b*d^3)*x)*log((b*e*x
 + a*e)/(d*x + c))^2 - 3*((18*A^2 + 30*A*B + 19*B^2)*b^3*c^2*d - 54*(2*A^2
+ 6*A*B + 7*B^2)*a*b^2*c*d^2 + (90*A^2 + 294*A*B + 359*B^2)*a^2*b*d^3)*x +
6*((18*A^2 + 66*A*B + 85*B^2)*b^3*d^3*x^3 + 18*A^2*a^3*d^3 + 4*(3*A*B + B^2
)*b^3*c^3 - 27*(2*A*B + B^2)*a*b^2*c^2*d + 108*(A*B + B^2)*a^2*b*c*d^2 + 3*
(2*(6*A*B + 11*B^2)*b^3*c*d^2 + 9*(2*A^2 + 6*A*B + 7*B^2)*a*b^2*d^3)*x^2 -
3*((6*A*B + 5*B^2)*b^3*c^2*d - 18*(2*A*B + 3*B^2)*a*b^2*c*d^2 - 18*(A^2 + 2
*A*B + 2*B^2)*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^7*c^4 - 4*a*b
^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*i*x^3 + 3
*(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b
^2*d^4)*g^4*i*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 -
4*a^5*b^2*c*d^3 + a^6*b*d^4)*g^4*i*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a
^5*b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4*i)
```

Sympy [B] time = 50.194, size = 2388, normalized size = 4.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

```
[Out] -B**2*d**3*log(e*(a + b*x)/(c + d*x))**3/(3*a**4*d**4*g**4*i - 12*a**3*b*c*
d**3*g**4*i + 18*a**2*b**2*c**2*d**2*g**4*i - 12*a*b**3*c**3*d*g**4*i + 3*b
**4*c**4*g**4*i) + d**3*(18*A**2 + 66*A*B + 85*B**2)*log(x + (18*A**2*a*d**
4 + 18*A**2*b*c*d**3 + 66*A*B*a*d**4 + 66*A*B*b*c*d**3 + 85*B**2*a*d**4 + 8
5*B**2*b*c*d**3 - a**5*d**8*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 5
*a**4*b*c*d**7*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 10*a**3*b**2*c
**2*d**6*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 10*a**2*b**3*c**3*d*
*5*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 5*a*b**4*c**4*d**4*(18*A**
2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + b**5*c**5*d**3*(18*A**2 + 66*A*B + 8
5*B**2)/(a*d - b*c)**4)/(36*A**2*b*d**4 + 132*A*B*b*d**4 + 170*B**2*b*d**4)
)/(18*g**4*i*(a*d - b*c)**4) - d**3*(18*A**2 + 66*A*B + 85*B**2)*log(x + (1
8*A**2*a*d**4 + 18*A**2*b*c*d**3 + 66*A*B*a*d**4 + 66*A*B*b*c*d**3 + 85*B**
2*a*d**4 + 85*B**2*b*c*d**3 + a**5*d**8*(18*A**2 + 66*A*B + 85*B**2)/(a*d -
 b*c)**4 - 5*a**4*b*c*d**7*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 10
*a**3*b**2*c**2*d**6*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 10*a**2*
b**3*c**3*d**5*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 5*a*b**4*c**4*
d**4*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - b**5*c**5*d**3*(18*A**2
+ 66*A*B + 85*B**2)/(a*d - b*c)**4)/(36*A**2*b*d**4 + 132*A*B*b*d**4 + 170*
B**2*b*d**4))/(18*g**4*i*(a*d - b*c)**4) + (66*A*B*a**2*d**2 - 42*A*B*a*b*c
*d + 90*A*B*a*b*d**2*x + 12*A*B*b**2*c**2 - 18*A*B*b**2*c*d*x + 36*A*B*b**2
*d**2*x**2 + 85*B**2*a**2*d**2 - 23*B**2*a*b*c*d + 147*B**2*a*b*d**2*x + 4*
B**2*b**2*c**2 - 15*B**2*b**2*c*d*x + 66*B**2*b**2*d**2*x**2)*log(e*(a + b*
x)/(c + d*x))/(18*a**6*d**3*g**4*i - 54*a**5*b*c*d**2*g**4*i + 54*a**5*b*d*
*3*g**4*i*x + 54*a**4*b**2*c**2*d*g**4*i - 162*a**4*b**2*c*d**2*g**4*i*x +
54*a**4*b**2*d**3*g**4*i*x**2 - 18*a**3*b**3*c**3*g**4*i + 162*a**3*b**3*c*
*2*d*g**4*i*x - 162*a**3*b**3*c*d**2*g**4*i*x**2 + 18*a**3*b**3*d**3*g**4*i
*x**3 - 54*a**2*b**4*c**3*g**4*i*x + 162*a**2*b**4*c**2*d*g**4*i*x**2 - 54*
a**2*b**4*c*d**2*g**4*i*x**3 - 54*a*b**5*c**3*g**4*i*x**2 + 54*a*b**5*c**2*
d*g**4*i*x**3 - 18*b**6*c**3*g**4*i*x**3) + (-6*A*B*a**3*d**3 - 18*A*B*a**2
*b*d**3*x - 18*A*B*a*b**2*d**3*x**2 - 6*A*B*b**3*d**3*x**3 - 18*B**2*a**2*b
```

```
*c*d**2 - 18*B**2*a**2*b*d**3*x + 9*B**2*a*b**2*c**2*d - 18*B**2*a*b**2*c*d
**2*x - 27*B**2*a*b**2*d**3*x**2 - 2*B**2*b**3*c**3 + 3*B**2*b**3*c**2*d*x
- 6*B**2*b**3*c*d**2*x**2 - 11*B**2*b**3*d**3*x**3)*log(e*(a + b*x)/(c + d*
x))**2/(6*a**7*d**4*g**4*i - 24*a**6*b*c*d**3*g**4*i + 18*a**6*b*d**4*g**4*
i*x + 36*a**5*b**2*c**2*d**2*g**4*i - 72*a**5*b**2*c*d**3*g**4*i*x + 18*a**
5*b**2*d**4*g**4*i*x**2 - 24*a**4*b**3*c**3*d*g**4*i + 108*a**4*b**3*c**2*d
**2*g**4*i*x - 72*a**4*b**3*c*d**3*g**4*i*x**2 + 6*a**4*b**3*d**4*g**4*i*x*
*3 + 6*a**3*b**4*c**4*g**4*i - 72*a**3*b**4*c**3*d*g**4*i*x + 108*a**3*b**4
*c**2*d**2*g**4*i*x**2 - 24*a**3*b**4*c*d**3*g**4*i*x**3 + 18*a**2*b**5*c**
4*g**4*i*x - 72*a**2*b**5*c**3*d*g**4*i*x**2 + 36*a**2*b**5*c**2*d**2*g**4*
i*x**3 + 18*a*b**6*c**4*g**4*i*x**2 - 24*a*b**6*c**3*d*g**4*i*x**3 + 6*b**7
*c**4*g**4*i*x**3) + (198*A**2*a**2*d**2 - 126*A**2*a*b*c*d + 36*A**2*b**2*
c**2 + 510*A*B*a**2*d**2 - 138*A*B*a*b*c*d + 24*A*B*b**2*c**2 + 575*B**2*a*
*2*d**2 - 73*B**2*a*b*c*d + 8*B**2*b**2*c**2 + x**2*(108*A**2*b**2*d**2 + 3
96*A*B*b**2*d**2 + 510*B**2*b**2*d**2) + x*(270*A**2*a*b*d**2 - 54*A**2*b**
2*c*d + 882*A*B*a*b*d**2 - 90*A*B*b**2*c*d + 1077*B**2*a*b*d**2 - 57*B**2*b
**2*c*d))/(108*a**6*d**3*g**4*i - 324*a**5*b*c*d**2*g**4*i + 324*a**4*b**2*
c**2*d*g**4*i - 108*a**3*b**3*c**3*g**4*i + x**3*(108*a**3*b**3*d**3*g**4*i
 - 324*a**2*b**4*c*d**2*g**4*i + 324*a*b**5*c**2*d*g**4*i - 108*b**6*c**3*g
**4*i) + x**2*(324*a**4*b**2*d**3*g**4*i - 972*a**3*b**3*c*d**2*g**4*i + 97
2*a**2*b**4*c**2*d*g**4*i - 324*a*b**5*c**3*g**4*i) + x*(324*a**5*b*d**3*g*
*4*i - 972*a**4*b**2*c*d**2*g**4*i + 972*a**3*b**3*c**2*d*g**4*i - 324*a**2
*b**4*c**3*g**4*i))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^4(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^4*(d*i*x + c*
i)), x)
```

3.92 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=722

$$-\frac{6bBg^3(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^4i^2}-\frac{6bB^2g^3(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^2}-\frac{bB^2g^3(bc-ad}{}$$

```
[Out] (2*A*B*(b*c - a*d)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) - (2*B^2*(b*c - a*d
)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)^2*g^3*(a + b*x)
*Log[(e*(a + b*x))/(c + d*x)])/(d^3*i^2*(c + d*x)) - (b*B*(b*c - a*d)*g^3*(
a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2) - (6*b*B*(b*c - a*
d)^2*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(d^4*i^2) - (3*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])^2)/(d^3*i^2) - ((b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/(d^3*i^2*(c + d*x)) + (b^3*g^3*(c + d*x)^2*(A + B*Log[(e*(
a + b*x))/(c + d*x)])^2)/(2*d^4*i^2) - (3*b*(b*c - a*d)^2*g^3*Log[(b*c - a*
d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^4*i^2) + (b*B^
2*(b*c - a*d)^2*g^3*Log[c + d*x])/(d^4*i^2) + (b*B*(b*c - a*d)^2*g^3*(A + B
*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(d^4*i
^2) - (6*b*B^2*(b*c - a*d)^2*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(
d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2) - (b*B^2*(b*c - a*d)^2*g^3
*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^
2*g^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2)
```

Rubi [B] time = 6.14966, antiderivative size = 2224, normalized size of antiderivative = 3.08, number of steps used = 119, number of rules used = 28, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
2,x]
```

```
[Out] -((A*b^2*B*(b*c - a*d)*g^3*x)/(d^3*i^2)) + (2*B^2*(b*c - a*d)^3*g^3)/(d^4*i
^2*(c + d*x)) + (2*b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x])/(d^4*i^2) + (a^2*b
*B^2*g^3*Log[a + b*x]^2)/(2*d^2*i^2) + (a*b*B^2*(2*b*c - 3*a*d)*g^3*Log[a +
 b*x]^2)/(d^3*i^2) + (b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]^2)/(d^4*i^2) - (
3*b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(d^4*i^2) + (
3*b*B^2*(b*c - a*d)^2*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(
-1)]^2)/(d^4*i^2) - (b*B^2*(b*c - a*d)*g^3*(a + b*x)*Log[(e*(a + b*x))/(c +
 d*x)])/(d^3*i^2) - (2*B*(b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(d^4*i^2*(c + d*x)) - (a^2*b*B*g^3*Log[a + b*x]*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(d^2*i^2) - (2*a*b*B*(2*b*c - 3*a*d)*g^3*Log[a + b*x]*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2) - (2*b*B*(b*c - a*d)^2*g^3*Log[
a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i^2) - (b^2*(2*b*c - 3*
a*d)*g^3*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i^2) + (b^3*g^3*x^2
*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d^2*i^2) + ((b*c - a*d)^3*g^3*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^4*i^2*(c + d*x)) - (b*B^2*(b*c -
a*d)^2*g^3*Log[c + d*x])/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x
```

```
]^2*Log[c + d*x])/(d^4*i^2) - (b^3*B^2*c^2*g^3*Log[-((d*(a + b*x))/(b*c - a
*d))]*Log[c + d*x])/(d^4*i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3*Log[-((d*(
a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^2) - (6*A*b*B*(b*c - a*d)^2*g^
3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^2) - (2*b*B^2*(b*c
 - a*d)^2*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^2) - (
6*b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/(d
^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log
[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x
])/(d^4*i^2) + (b^3*B*c^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
d*x])/(d^4*i^2) + (2*b^2*B*c*(2*b*c - 3*a*d)*g^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x])/(d^4*i^2) + (2*b*B*(b*c - a*d)^2*g^3*(A + B*Log[(e
*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^4*i^2) + (3*b*(b*c - a*d)^2*g^3*(A
 + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/(d^4*i^2) + (b^3*B^2*c^2
*g^3*Log[c + d*x]^2)/(2*d^4*i^2) + (b^2*B^2*c*(2*b*c - 3*a*d)*g^3*Log[c + d
*x]^2)/(d^4*i^2) + (3*A*b*B*(b*c - a*d)^2*g^3*Log[c + d*x]^2)/(d^4*i^2) + (
b*B^2*(b*c - a*d)^2*g^3*Log[c + d*x]^2)/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*
g^3*Log[a + b*x]*Log[c + d*x]^2)/(d^4*i^2) + (3*b*B^2*(b*c - a*d)^2*g^3*Log
[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/(d^4*i^2) + (b*B^2*(b*c - a*d)^2*
g^3*Log[c + d*x]^3)/(d^4*i^2) - (a^2*b*B^2*g^3*Log[a + b*x]*Log[(b*(c + d*x
))/(b*c - a*d)])/(d^2*i^2) - (2*a*b*B^2*(2*b*c - 3*a*d)*g^3*Log[a + b*x]*Lo
g[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*Log[a
 + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) + (3*b*B^2*(b*c - a*d)^2*g
^3*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) - (a^2*b*B^2*g^
3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i^2) - (2*a*b*B^2*(2*b*c -
 3*a*d)*g^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) - (2*b*B^2*
(b*c - a*d)^2*g^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^2) + (6*
b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d)
)])/(d^4*i^2) - (b^3*B^2*c^2*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^
4*i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])/(d^4*i^2) - (6*A*b*B*(b*c - a*d)^2*g^3*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])/(d^4*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*Log[(c + d*x)^(-1)]*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*(
Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*PolyL
og[3, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3
*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
```

```
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(92c+92dx)^2}\,dx = \int\left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^2}\right.$$

$$=\frac{\left(b^3g^3\right)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx}{8464d^2}-\frac{\left(b^2(2bc-3ad)g^3\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{8464d^3}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{16928d^2}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{16928d^2}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{16928d^2}$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8464d^3}+\frac{b^3g^3x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{16928d^2}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}-\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4232d^4(c+dx)}-\frac{a^2bBg^3\log(a}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}-\frac{bB^2(bc-ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{8464d^3}-\frac{B(bc-ad)^3g^3}{423}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}-\frac{bB^2(bc-ad)g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{8464d^3}-\frac{B(bc-ad)^3g^3}{423}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}-\frac{bB}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}-\frac{bB}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}+\frac{a^2}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}+\frac{a^2}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}+\frac{a^2}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}+\frac{a^2}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}+\frac{a^2}{}$$

$$=-\frac{Ab^2B(bc-ad)g^3x}{8464d^3}+\frac{B^2(bc-ad)^3g^3}{4232d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3\log(a+bx)}{4232d^4}+\frac{a^2}{}$$

Mathematica [B] time = 7.4011, size = 5193, normalized size = 7.19

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 2.414, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^2} \left(A + B \ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] 1/2*(2*c^3/(d^5*i^2*x + c*d^4*i^2) + 6*c^2*log(d*x + c)/(d^4*i^2) + (d*x^2
- 4*c*x)/(d^3*i^2))*A^2*b^3*g^3 - 3*A^2*a*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2)
- x/(d^2*i^2) + 2*c*log(d*x + c)/(d^3*i^2))*g^3 + 3*A^2*a^2*b*g^3*(c/(d^3*i
^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i^2)) - 2*A*B*a^3*g^3*(log(b*e*x/(d*x
 + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2*x + c*d*i^2) - b*
log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*log(d*x + c)/((b*c*d - a*d^2)*i^2))
- A^2*a^3*g^3/(d^2*i^2*x + c*d*i^2) + 1/2*(2*((b^3*c^2*d*g^3 - 2*a*b^2*c*d^
2*g^3 + a^2*b*d^3*g^3)*B^2*x + (b^3*c^3*g^3 - 2*a*b^2*c^2*d*g^3 + a^2*b*c*d
^2*g^3)*B^2)*log(d*x + c)^3 + (B^2*b^3*d^3*g^3*x^3 - 3*(b^3*c*d^2*g^3 - 2*a
*b^2*d^3*g^3)*B^2*x^2 - 2*(2*b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3)*B^2*x + 2*(
b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*B^2)*log
(d*x + c)^2)/(d^5*i^2*x + c*d^4*i^2) - integrate(-(B^2*a^3*d^3*g^3*log(e)^2
 + (B^2*b^3*d^3*g^3*log(e)^2 + 2*A*B*b^3*d^3*g^3*log(e))*x^3 + 3*(B^2*a*b^2
*d^3*g^3*log(e)^2 + 2*A*B*a*b^2*d^3*g^3*log(e))*x^2 + (B^2*b^3*d^3*g^3*x^3
+ 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*log(b*
x + a)^2 + 3*(B^2*a^2*b*d^3*g^3*log(e)^2 + 2*A*B*a^2*b*d^3*g^3*log(e))*x +
2*(B^2*a^3*d^3*g^3*log(e) + (B^2*b^3*d^3*g^3*log(e) + A*B*b^3*d^3*g^3)*x^3
+ 3*(B^2*a*b^2*d^3*g^3*log(e) + A*B*a*b^2*d^3*g^3)*x^2 + 3*(B^2*a^2*b*d^3*g
^3*log(e) + A*B*a^2*b*d^3*g^3)*x)*log(b*x + a) - ((2*A*B*b^3*d^3*g^3 + (2*g
^3*log(e) + g^3)*B^2*b^3*d^3)*x^3 + 2*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*
a^2*b*c*d^2*g^3 + (g^3*log(e) - g^3)*a^3*d^3)*B^2 + 3*(2*A*B*a*b^2*d^3*g^3
- (b^3*c*d^2*g^3 - 2*(g^3*log(e) + g^3)*a*b^2*d^3)*B^2)*x^2 + 2*(3*A*B*a^2*
```

```
b*d^3*g^3 + (3*a^2*b*d^3*g^3*log(e) - 2*b^3*c^2*d*g^3 + 3*a*b^2*c*d^2*g^3)*
B^2)*x + 2*(B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3
*g^3*x + B^2*a^3*d^3*g^3)*log(b*x + a))*log(d*x + c))/(d^5*i^2*x^2 + 2*c*d^
4*i^2*x + c^2*d^3*i^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\right.}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a
^3*g^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g
^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((b*e*x + a*e)/(d*x + c)))/(d^
2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(dix + ci)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i
)^2, x)
```

3.93 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=469

$$\frac{4bBg^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^2}+\frac{2bB^2g^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}-\frac{4bB^2g^2(bc-ad)\text{Poly}}{d^3i^2}$$

```
[Out] (-2*A*B*(b*c - a*d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)
*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) - (2*B^2*(b*c - a*d)*g^2*(a + b*x)*Log[
(e*(a + b*x))/(c + d*x)])/(d^2*i^2*(c + d*x)) + (2*b*B*(b*c - a*d)*g^2*Log[
(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2)
+ (b*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2) + ((b*
c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2*(c
+ d*x)) + (2*b*(b*c - a*d)*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*PolyLog[2,
(d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) + (4*b*B*(b*c - a*d)*g^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^
2) - (4*b*B^2*(b*c - a*d)*g^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3
*i^2)
```

Rubi [B] time = 5.09331, antiderivative size = 1681, normalized size of antiderivative = 3.58, number of steps used = 94, number of rules used = 26, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*g^2)/(d^3*i^2*(c + d*x)) - (2*b*B^2*(b*c - a*d)*g^2*L
og[a + b*x])/(d^3*i^2) - (a*b*B^2*g^2*Log[a + b*x]^2)/(d^2*i^2) - (b*B^2*(b
*c - a*d)*g^2*Log[a + b*x]^2)/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*Log[a +
b*x]*Log[(c + d*x)^(-1)]^2)/(d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*Log[-((d*(
a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(d^3*i^2) + (2*B*(b*c - a*d)
^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2*(c + d*x)) + (2*a*b*B
*g^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i^2) + (2*b*B*
(b*c - a*d)*g^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2
) + (b^2*g^2*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2) - ((b*c -
a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i^2*(c + d*x)) + (2
*b*B^2*(b*c - a*d)*g^2*Log[c + d*x])/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*L
og[a + b*x]^2*Log[c + d*x])/(d^3*i^2) + (2*b^2*B^2*c*g^2*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x])/(d^3*i^2) + (4*A*b*B*(b*c - a*d)*g^2*Log[-((d
*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^
2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3*i^2) + (4*b*B^2*(b*c
 - a*d)*g^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/(d^3*i^2) - (4*b
*B^2*(b*c - a*d)*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[
(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^3*i^2) - (
2*b^2*B*c*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^3*i^2)
- (2*b*B*(b*c - a*d)*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])
/(d^3*i^2) - (2*b*(b*c - a*d)*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Lo
g[c + d*x])/(d^3*i^2) - (b^2*B^2*c*g^2*Log[c + d*x]^2)/(d^3*i^2) - (2*A*b*B
```

```
*(b*c - a*d)*g^2*Log[c + d*x]^2)/(d^3*i^2) - (b*B^2*(b*c - a*d)*g^2*Log[c +
 d*x]^2)/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*Log[a + b*x]*Log[c + d*x]^2)/
(d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d
*x]^2)/(d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*Log[c + d*x]^3)/(3*d^3*i^2) + (
2*a*b*B^2*g^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) + (2*b
*B^2*(b*c - a*d)*g^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^2)
 - (2*b*B^2*(b*c - a*d)*g^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/
(d^3*i^2) + (2*a*b*B^2*g^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i
^2) + (2*b*B^2*(b*c - a*d)*g^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d
^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/
(b*c - a*d))])/(d^3*i^2) + (2*b^2*B^2*c*g^2*PolyLog[2, (b*(c + d*x))/(b*c -
 a*d)])/(d^3*i^2) + (4*A*b*B*(b*c - a*d)*g^2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*Log[(c + d*x)^(-1)]*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*(Log[a
+ b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*PolyLog[3, -(
(d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*PolyLog[3
, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
```

```
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(93c+93dx)^2}\,dx = \int\left(\frac{b^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} + \frac{(-bc+ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2(c+dx)^2} - \cdots\right.$$

$$= \frac{\left(b^2g^2\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{8649d^2} - \frac{\left(2b(bc-ad)g^2\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{8649d^2} \cdots$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^3(c+dx)} - \frac{2b(bc\cdots}{\cdots}$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^3(c+dx)} - \frac{2b(bc\cdots}{\cdots}$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^3(c+dx)} - \frac{2b(bc\cdots}{\cdots}$$

$$= \frac{b^2g^2x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8649d^3(c+dx)} - \frac{2b(bc\cdots}{\cdots}$$

$$= \frac{2B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8649d^3(c+dx)} + \frac{2abBg^2\log(a+bx)\left(A+B\log\left(\frac{e(a\cdots}{c\cdots}\right.\right.}{8649d^2}$$

$$= \frac{2B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8649d^3(c+dx)} + \frac{2abBg^2\log(a+bx)\left(A+B\log\left(\frac{e(a\cdots}{c\cdots}\right.\right.}{8649d^2}$$

$$= \frac{2B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8649d^3(c+dx)} + \frac{2abBg^2\log(a+bx)\left(A+B\log\left(\frac{e(a\cdots}{c\cdots}\right.\right.}{8649d^2}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} + \frac{2B(bc-ad)^2g^2\left(A+B\cdots\right.}{8649d^3(c+\cdots}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} + \frac{2B(bc-ad)^2g^2\left(A+B\cdots\right.}{8649d^3(c+\cdots}$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log^2(a+bx)}{8649d^2} - \cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log^2(a+bx)}{8649d^2} - \cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log^2(a+bx)}{8649d^2} - \cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log^2(a+bx)}{8649d^2} - \cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log^2(a+bx)}{8649d^2} - \cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2}{8649d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2\log(a+bx)}{8649d^3} - \frac{abB^2g^2\log^2(a+bx)}{8649d^2} - \cdots$$

Mathematica [B] time = 4.67378, size = 1969, normalized size = 4.2

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] (g^2*(A^2*b^2*d*x - (A^2*(b*c - a*d)^2)/(c + d*x) + 2*A^2*b*(-(b*c) + a*d)*
Log[c + d*x] + (2*a^2*A*B*d^2*(b*c - a*d + b*(c + d*x)*Log[a/b + x] + (-(b*
c) + a*d)*Log[(e*(a + b*x))/(c + d*x)] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]
 - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)*(c + d*x)) + 2*a*A*b
*B*d*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c + d*x] + 2*(-(c/(c + d*x)) + (
b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c + d*x])/(b*c - a*d) - Log[a/b
 + x]*Log[c + d*x] + Log[(e*(a + b*x))/(c + d*x)]*(c/(c + d*x) + Log[c + d*
x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)]) + 2*A*b^2*B*(d*(a/b + x)*(-1 + Log[a/b + x]) - (c^2*L
og[a/b + x])/(c + d*x) - (c + d*x)*(-1 + Log[c/d + x]) + c*Log[c/d + x]^2 +
 (c^2*(1 + Log[c/d + x]))/(c + d*x) + (b*c^2*(Log[a + b*x] - Log[c + d*x]))
/(b*c - a*d) + (-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)]
)*(d*x - c^2/(c + d*x) - 2*c*Log[c + d*x]) - 2*c*(Log[a/b + x]*Log[(b*(c +
d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) - (a^2*B^2*
d^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a +
 b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]
 + (b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*b*(c + d*x)*Log[c + d*x]
- 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
 + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)
/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*
(c + d*x)) + b^2*B^2*((d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2)/b - (c^2
*Log[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) + 2*c*Log[(e*(a + b*x))/(c + d*x
)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (c^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*L
og[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Lo
g[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*
(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(
c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/
(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c
+ b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d
*x)) - ((b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-
(b*c) + a*d)] - 2*Log[(e*(a + b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d
*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b + 4*c*(Log[(e*(a + b*x)
)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b
*x))/(b*(c + d*x))])) + 2*a*b*B^2*d*((c*Log[(e*(a + b*x))/(c + d*x)]^2)/(c
+ d*x) - Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*
Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(
2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x)
)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*
b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(
b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log
[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
+ b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])))/((b*c - a*d)*(c + d*x)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*
x))])))/(d^3*i^2)
```

Maple [F] time = 2.125, size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2}{(dix+ci)^2}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] -A^2*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x + c)/(d^3
*i^2))*g^2 + 2*A^2*a*b*g^2*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i
^2)) - 2*A*B*a^2*g^2*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d
*i^2) - 1/(d^2*i^2*x + c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*
log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A^2*a^2*g^2/(d^2*i^2*x + c*d*i^2) - 1
/3*(2*((b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*x + (b^2*c^2*g^2 - a*b*c*d*g^2)*B^2)
*log(d*x + c)^3 - 3*(B^2*b^2*d^2*g^2*x^2 + B^2*b^2*c*d*g^2*x - (b^2*c^2*g^2
 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2)*log(d*x + c)^2)/(d^4*i^2*x + c*d^3*i^2
) - integrate(-(B^2*a^2*d^2*g^2*log(e)^2 + (B^2*b^2*d^2*g^2*log(e)^2 + 2*A*
B*b^2*d^2*g^2*log(e))*x^2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^
2*a^2*d^2*g^2)*log(b*x + a)^2 + 2*(B^2*a*b*d^2*g^2*log(e)^2 + 2*A*B*a*b*d^2
*g^2*log(e))*x + 2*(B^2*a^2*d^2*g^2*log(e) + (B^2*b^2*d^2*g^2*log(e) + A*B*
b^2*d^2*g^2)*x^2 + 2*(B^2*a*b*d^2*g^2*log(e) + A*B*a*b*d^2*g^2)*x)*log(b*x
+ a) + 2*((b^2*c^2*g^2 - 2*a*b*c*d*g^2 - (g^2*log(e) - g^2)*a^2*d^2)*B^2 -
(A*B*b^2*d^2*g^2 + (g^2*log(e) + g^2)*B^2*b^2*d^2)*x^2 - (2*A*B*a*b*d^2*g^2
 + (2*a*b*d^2*g^2*log(e) + b^2*c*d*g^2)*B^2)*x - (B^2*b^2*d^2*g^2*x^2 + 2*B
^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(b*x + a))*log(d*x + c))/(d^4*i^2*x^
2 + 2*c*d^3*i^2*x + c^2*d^2*i^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABb^2g^2x^2 + 2\,ABa\right.}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^
2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*
b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/
```

```
(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i
)^2, x)
```

3.94 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=261

$$-\frac{2bBg\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^2}+\frac{2bB^2g\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right.}{d^2i^2}$$

```
[Out] (2*A*B*g*(a + b*x))/(d*i^2*(c + d*x)) - (2*B^2*g*(a + b*x))/(d*i^2*(c + d*x
)) + (2*B^2*g*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d*i^2*(c + d*x)) - (
g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d*i^2*(c + d*x)) - (b*
g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d
^2*i^2) - (2*b*B*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a +
b*x))/(b*(c + d*x))])/(d^2*i^2) + (2*b*B^2*g*PolyLog[3, (d*(a + b*x))/(b*(c
 + d*x))])/(d^2*i^2)
```

Rubi [B] time = 4.24162, antiderivative size = 1060, normalized size of antiderivative = 4.06, number of steps used = 72, number of rules used = 25, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{bB^2g\log^3(c+dx)}{3d^2i^2}-\frac{bB^2g\log(a+bx)\log^2(c+dx)}{d^2i^2}+\frac{bB^2g\log\left(\frac{e(a+bx)}{c+dx}\right)\log^2(c+dx)}{d^2i^2}+\frac{bB^2g\log^2(c+dx)}{d^2i^2}+\frac{AbBg\log}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^2,
x]
```

```
[Out] (2*B^2*(b*c - a*d)*g)/(d^2*i^2*(c + d*x)) + (2*b*B^2*g*Log[a + b*x])/(d^2*i
^2) + (b*B^2*g*Log[a + b*x]^2)/(d^2*i^2) - (b*B^2*g*Log[a + b*x]*Log[(c + d
*x)^(-1)]^2)/(d^2*i^2) + (b*B^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c
+ d*x)^(-1)]^2)/(d^2*i^2) - (2*B*(b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(d^2*i^2*(c + d*x)) - (2*b*B*g*Log[a + b*x]*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(d^2*i^2) + ((b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/(d^2*i^2*(c + d*x)) - (2*b*B^2*g*Log[c + d*x])/(d^2*i^2) - (b*B^2*
g*Log[a + b*x]^2*Log[c + d*x])/(d^2*i^2) - (2*A*b*B*g*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x])/(d^2*i^2) - (2*b*B^2*g*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/(d^2*i^2) - (2*b*B^2*g*Log[a + b*x]*Log[(c + d*x)^(-
1)]*Log[c + d*x])/(d^2*i^2) + (2*b*B^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*
(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c +
 d*x])/(d^2*i^2) + (2*b*B*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*
x])/(d^2*i^2) + (b*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/(
d^2*i^2) + (A*b*B*g*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*Log[c + d*x]^2)/(d
^2*i^2) - (b*B^2*g*Log[a + b*x]*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*Log[(e
*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*Log[c + d*x]^3)
/(3*d^2*i^2) - (2*b*B^2*g*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2
*i^2) + (b*B^2*g*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) -
 (2*b*B^2*g*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i^2) + (2*b*B^2*
g*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i^2) - (2*A*b
*B*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) - (2*b*B^2*g*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) - (2*b*B^2*g*Log[(c + d*x)^(-1)]*P
olyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) + (2*b*B^2*g*(Log[a + b*x]
+ Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*
```

```
x))/(b*c - a*d)])/(d^2*i^2) - (2*b*B^2*g*PolyLog[3, -((d*(a + b*x))/(b*c -
a*d))])/(d^2*i^2) - (2*b*B^2*g*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^2*
i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(94c+94dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d(c+dx)^2} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d(c+dx)}\right)dx$$

$$= \frac{(bg)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{8836d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2}\,dx}{8836d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{8836d^2} - \frac{(bB}{\ldots}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{8836d^2} - \frac{(B(}{\ldots}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{8836d^2} - \frac{(B(}{\ldots}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{8836d^2(c+dx)} + \frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(c+dx)}{8836d^2} - \frac{(b^2}{\ldots}$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2} + \ldots$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2} + \ldots$$

$$= -\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2} + \ldots$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} - \frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg}{\ldots}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} - \frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4418d^2(c+dx)} - \frac{bBg}{\ldots}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{B(bc-ad)g\left(A+B\ldots\right.}{4418d^2(c\ldots}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{B(bc-ad)g\left(A+B\ldots\right.}{4418d^2(c\ldots}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{B(bc-ad)g\left(A+B\ldots\right.}{4418d^2(c\ldots}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{bB^2g\log(a+bx)\,\mathrm{lo}\ldots}{8836d^2}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{bB^2g\log(a+bx)\,\mathrm{lo}\ldots}{8836d^2}$$

$$= \frac{B^2(bc-ad)g}{4418d^2(c+dx)} + \frac{bB^2g\log(a+bx)}{4418d^2} + \frac{bB^2g\log^2(a+bx)}{8836d^2} - \frac{bB^2g\log(a+bx)\,\mathrm{lo}\ldots}{8836d^2}$$

Mathematica [B] time = 1.90629, size = 1107, normalized size = 4.24

$$g\left(b\log(c+dx)A^2+\frac{(bc-ad)A^2}{c+dx}+\frac{2aBd\left(bc-b\log\left(\frac{b(c+dx)}{bc-ad}\right)c-ad+b(c+dx)\log\left(\frac{a}{b}+x\right)+(ad-bc)\log\left(\frac{e(a+bx)}{c+dx}\right)-bdx\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)A}{(bc-ad)(c+dx)}+bB\left(-\log^2\left(\frac{c}{d}\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i
*x)^2,x]
```

```
[Out] (g*((A^2*(b*c - a*d))/(c + d*x) + A^2*b*Log[c + d*x] + (2*a*A*B*d*(b*c - a*
d + b*(c + d*x)*Log[a/b + x] + (-(b*c) + a*d)*Log[(e*(a + b*x))/(c + d*x)]
- b*c*Log[(b*(c + d*x))/(b*c - a*d)] - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]
))/((b*c - a*d)*(c + d*x)) + A*b*B*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c
+ d*x] + 2*(-(c/(c + d*x)) + (b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c
 + d*x])/(b*c - a*d) - Log[a/b + x]*Log[c + d*x] + Log[(e*(a + b*x))/(c + d
*x)]*(c/(c + d*x) + Log[c + d*x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a
*d)]) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - (a*B^2*d*(2*b*c - 2*a
*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)
] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + (b*c - a*d)*L
og[(e*(a + b*x))/(c + d*x)]^2 - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*
Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(
Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[
2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d
*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)])
 - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + b*B
^2*((c*Log[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) - Log[(e*(a + b*x))/(c + d
*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Log[(e*(a + b*x))/(c + d*x)]*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log
[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[
a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c
 + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c
+ d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*
PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b
*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c +
b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x
)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i^2)
```

Maple [F] time = 1.969, size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{(dix+ci)^2}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^2bg\left(\frac{c}{d^3i^2x+cd^2i^2}+\frac{\log(dx+c)}{d^2i^2}\right)-2\,ABag\left(\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{d^2i^2x+cdi^2}-\frac{1}{d^2i^2x+cdi^2}-\frac{b\log(bx+a)}{\left(bcd-ad^2\right)i^2}+\frac{b\log(dx+c)}{\left(bcd-ad^2\right)i^2}\right)-\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] A^2*b*g*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i^2)) - 2*A*B*a*g*(l
og(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2*x +
c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*log(d*x + c)/((b*c*d -
a*d^2)*i^2)) - A^2*a*g/(d^2*i^2*x + c*d*i^2) + 1/3*(3*(b*c*g - a*d*g)*B^2*l
og(d*x + c)^2 + (B^2*b*d*g*x + B^2*b*c*g)*log(d*x + c)^3)/(d^3*i^2*x + c*d^
2*i^2) - integrate(-(B^2*a*d*g*log(e)^2 + (B^2*b*d*g*x + B^2*a*d*g)*log(b*x
 + a)^2 + (B^2*b*d*g*log(e)^2 + 2*A*B*b*d*g*log(e))*x + 2*(B^2*a*d*g*log(e)
 + (B^2*b*d*g*log(e) + A*B*b*d*g)*x)*log(b*x + a) - 2*(((g*log(e) - g)*a*d
+ b*c*g)*B^2 + (B^2*b*d*g*log(e) + A*B*b*d*g)*x + (B^2*b*d*g*x + B^2*a*d*g)
*log(b*x + a))*log(d*x + c))/(d^3*i^2*x^2 + 2*c*d^2*i^2*x + c^2*d*i^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] integral((A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*e*x + a*e)/(d*
x + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*e*x + a*e)/(d*x + c)))/(d^2*i^2*
x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(dix + ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i)^
2, x)
```

3.95 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=152

$$\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{i^2(c+dx)(bc-ad)}-\frac{2AB(a+bx)}{i^2(c+dx)(bc-ad)}-\frac{2B^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{i^2(c+dx)(bc-ad)}+\frac{2B^2(a+bx)}{i^2(c+dx)(bc-ad)}$$

```
[Out] (-2*A*B*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) + (2*B^2*(a + b*x))/((b*c -
a*d)*i^2*(c + d*x)) - (2*B^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c
- a*d)*i^2*(c + d*x)) + ((a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
((b*c - a*d)*i^2*(c + d*x))
```

Rubi [C] time = 0.782059, antiderivative size = 472, normalized size of antiderivative = 3.11, number of steps used = 26, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2bB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{di^2(bc-ad)}+\frac{2bB^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di^2(bc-ad)}+\frac{2bB\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di^2(bc-ad)}+\frac{2B\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-2*B^2)/(d*i^2*(c + d*x)) - (2*b*B^2*Log[a + b*x])/(d*(b*c - a*d)*i^2) - (
b*B^2*Log[a + b*x]^2)/(d*(b*c - a*d)*i^2) + (2*B*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(d*i^2*(c + d*x)) + (2*b*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(d*(b*c - a*d)*i^2) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2
/(d*i^2*(c + d*x)) + (2*b*B^2*Log[c + d*x])/(d*(b*c - a*d)*i^2) + (2*b*B^2*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d*(b*c - a*d)*i^2) - (2*b*
B*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d*(b*c - a*d)*i^2) -
(b*B^2*Log[c + d*x]^2)/(d*(b*c - a*d)*i^2) + (2*b*B^2*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(d*(b*c - a*d)*i^2) + (2*b*B^2*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/(d*(b*c - a*d)*i^2) + (2*b*B^2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(d*(b*c - a*d)*i^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
```

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(95c+95dx)^2}dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{95(a+bx)(c+dx)^2}dx}{95d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)^2}dx}{9025d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} + \frac{(2B(bc-ad))\int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(c+dx)^2} - \frac{bd(A+B}{(bc-a}\right.}{9025d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)} - \frac{(2B)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2}dx}{9025} - \frac{(2bB)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}dx}{9025(bc-ad)} + \frac{(2b^2B)}{9}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc-ad)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc-ad)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc-ad)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c+dx)}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)(A+B}{9025d(bc-}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB\log(a+bx)(A+B}{9025d(bc-}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} - \frac{bB^2\log^2(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB}{}$$

$$= -\frac{2B^2}{9025d(c+dx)} - \frac{2bB^2\log(a+bx)}{9025d(bc-ad)} - \frac{bB^2\log^2(a+bx)}{9025d(bc-ad)} + \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c+dx)} + \frac{2bB}{}$$

Mathematica [C] time = 0.436611, size = 315, normalized size = 2.07

$$\frac{\frac{B\left(-bB(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bB(c+dx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2(bc-ad)}{bc-ad}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)*(A + B*Log[(e*
(a + b*x))/(c + d*x)]) + 2*b*(c + d*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]) - 2*b*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
d*x] - 2*B*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]
) - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*(c + d*x)*((2*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(d*i^2*(c + d*x))
```

Maple [B] time = 0.052, size = 1236, normalized size = 8.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] 1/d/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c-d/(a*d-b*c)
^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a^2+2*d/(a*d-b*c)^2/i^
2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-2/(a*d-b*c)^2/i^2*A*B*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-1/d/(a*d-b*c)^2/i^2*A^2/(d*x+c)*b^2*c^2+2/
(a*d-b*c)^2/i^2*A*B*b*a-2/d/(a*d-b*c)^2/i^2*A*B*b^2*c+2/d/(a*d-b*c)^2/i^2*A
*B/(d*x+c)*b^2*c^2-4/(a*d-b*c)^2/i^2*A*B/(d*x+c)*a*b*c-1/d/(a*d-b*c)^2/i^2*
B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b^2*c^2+2/(a*d-b*c)^2/i^2*B^2
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a*b*c+2/d/(a*d-b*c)^2/i^2*B^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-4/(a*d-b*c)^2/i^2*B^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c-2*d/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2/d/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*b^2*c-2*d/(a*d-b*c)^2/i^2*B^2/(d*x+c)*a^2+2/(a*d-b*c)^2/i^2*B^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-1/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2*b*a-d/(a*d-b*c)^2/i^2*A^2/(d*x+c)*a^2+2/d/(a*d-b*c)^2/i^
2*B^2*b^2*c+1/d/(a*d-b*c)^2/i^2*A^2*b^2*c-1/(a*d-b*c)^2/i^2*A^2*b*a-2/(a*d-
b*c)^2/i^2*B^2*b*a-2/d/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/
(d*x+c)*b^2*c^2+4/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+
c)*a*b*c+2*d/(a*d-b*c)^2/i^2*A*B/(d*x+c)*a^2-2/d/(a*d-b*c)^2/i^2*B^2/(d*x+c
)*b^2*c^2+4/(a*d-b*c)^2/i^2*B^2/(d*x+c)*a*b*c-2/d/(a*d-b*c)^2/i^2*B^2*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2/(a*d-b*c)^2/i^2*A^2/(d*x+c)*a*b*c
```

Maxima [B] time = 1.33913, size = 562, normalized size = 3.7

$$\left(2\left(\frac{1}{d^2i^2x+cdi^2}+\frac{b\log\left(bx+a\right)}{\left(bcd-ad^2\right)i^2}-\frac{b\log\left(dx+c\right)}{\left(bcd-ad^2\right)i^2}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{(bdx+bc)\log\left(bx+a\right)^2+(bdx+bc)\log(}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="maxima
")
```

```
[Out] (2*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*i^2) - b*log(
d*x + c)/((b*c*d - a*d^2)*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - ((b*
d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d +
2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))
*log(d*x + c))/(b*c^2*d*i^2 - a*c*d^2*i^2 + (b*c*d^2*i^2 - a*d^3*i^2)*x))*B
^2 - 2*A*B*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/
(d^2*i^2*x + c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*log(d*x +
c)/((b*c*d - a*d^2)*i^2)) - B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(d^2
*i^2*x + c*d*i^2) - A^2/(d^2*i^2*x + c*d*i^2)
```

Fricas [A] time = 0.512753, size = 319, normalized size = 2.1

$$-\frac{\left(A^2-2\,AB+2\,B^2\right)bc-\left(A^2-2\,AB+2\,B^2\right)ad-\left(B^2bdx+B^2ad\right)\log\left(\frac{bex+ae}{dx+c}\right)^2-2\left(\left(AB-B^2\right)bdx+\left(AB-B^2\right)ad\right)\log\left(\right.}{\left(bcd^2-ad^3\right)i^2x+\left(bc^2d-acd^2\right)i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="fricas
")
```

```
[Out] -((A^2 - 2*A*B + 2*B^2)*b*c - (A^2 - 2*A*B + 2*B^2)*a*d - (B^2*b*d*x + B^2*
a*d)*log((b*e*x + a*e)/(d*x + c))^2 - 2*((A*B - B^2)*b*d*x + (A*B - B^2)*a*
d)*log((b*e*x + a*e)/(d*x + c)))/((b*c*d^2 - a*d^3)*i^2*x + (b*c^2*d - a*c*
d^2)*i^2)
```

Sympy [B] time = 3.85915, size = 432, normalized size = 2.84

$$\frac{2Bb\,(A-B)\log\left(x+\frac{2ABabd+2ABb^2c-2B^2abd-2B^2b^2c-\frac{2Ba^2bd^2(A-B)}{ad-bc}+\frac{4Bab^2cd(A-B)}{ad-bc}-\frac{2Bb^3c^2(A-B)}{ad-bc}}{4ABb^2d-4B^2b^2d}\right)}{di^2\,(ad-bc)}-\frac{2Bb\,(A-B)\log\left(x+\frac{2ABabd+2ABb^2c-2\right.}{di^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] 2*B*b*(A - B)*log(x + (2*A*B*a*b*d + 2*A*B*b**2*c - 2*B**2*a*b*d - 2*B**2*b
**2*c - 2*B*a**2*b*d**2*(A - B)/(a*d - b*c) + 4*B*a*b**2*c*d*(A - B)/(a*d -
 b*c) - 2*B*b**3*c**2*(A - B)/(a*d - b*c))/(4*A*B*b**2*d - 4*B**2*b**2*d))/
(d*i**2*(a*d - b*c)) - 2*B*b*(A - B)*log(x + (2*A*B*a*b*d + 2*A*B*b**2*c -
2*B**2*a*b*d - 2*B**2*b**2*c + 2*B*a**2*b*d**2*(A - B)/(a*d - b*c) - 4*B*a*
b**2*c*d*(A - B)/(a*d - b*c) + 2*B*b**3*c**2*(A - B)/(a*d - b*c))/(4*A*B*b*
*2*d - 4*B**2*b**2*d))/(d*i**2*(a*d - b*c)) + (-2*A*B + 2*B**2)*log(e*(a +
b*x)/(c + d*x))/(c*d*i**2 + d**2*i**2*x) + (-B**2*a - B**2*b*x)*log(e*(a +
b*x)/(c + d*x))**2/(a*c*d*i**2 + a*d**2*i**2*x - b*c**2*i**2 - b*c*d*i**2*x
) - (A**2 - 2*A*B + 2*B**2)/(c*d*i**2 + d**2*i**2*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i)^2, x)
```

3.96 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=214

$$\frac{b\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bgi^2(bc-ad)^2}-\frac{d(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{gi^2(c+dx)(bc-ad)^2}+\frac{2ABd(a+bx)}{gi^2(c+dx)(bc-ad)^2}+\frac{2B^2d(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^2(c+dx)(bc-ad)^2}-\frac{}{gi^2}$$

```
[Out] (2*A*B*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) - (2*B^2*d*(a + b*x))/(
(b*c - a*d)^2*g*i^2*(c + d*x)) + (2*B^2*d*(a + b*x)*Log[(e*(a + b*x))/(c +
d*x)])/((b*c - a*d)^2*g*i^2*(c + d*x)) - (d*(a + b*x)*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*Log[(e*(a +
b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^2*g*i^2)
```

Rubi [C] time = 6.4707, antiderivative size = 1687, normalized size of antiderivative = 7.88, number of steps used = 87, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*x)^2),
x]
```

```
[Out] (2*B^2)/((b*c - a*d)*g*i^2*(c + d*x)) + (2*b*B^2*Log[a + b*x])/((b*c - a*d)
^2*g*i^2) - (A*b*B*Log[a + b*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b
*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(
(b*c - a*d)^2*g*i^2) - (b*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*
x)^(-1)]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[-((b*c - a*d)/(d*(a + b*x)))
]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[a + b*
x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g*i^2) - (2*B*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)*g*i^2*(c + d*x)) - (2*b*B*Log[a + b
*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g*i^2) + (A + B*Lo
g[(e*(a + b*x))/(c + d*x)])^2/((b*c - a*d)*g*i^2*(c + d*x)) + (b*Log[a + b*
x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*g*i^2) - (2*b*B^2
*Log[c + d*x])/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b*x]^2*Log[c + d*x])/
((b*c - a*d)^2*g*i^2) + (2*A*b*B*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
d*x])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Lo
g[c + d*x])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*Log[a + b*x]*Log[(c + d*x)^(-1
)]*Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[-((d*(a + b*x))/(b*c
- a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)]
)*Log[c + d*x])/((b*c - a*d)^2*g*i^2) + (2*b*B*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])*Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (b*(A + B*Log[(e*(a + b*x))/
(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (A*b*B*Log[c + d*x]^2)/
((b*c - a*d)^2*g*i^2) + (b*B^2*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B
^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[(e*(a +
b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[c + d*x
]^3)/(3*(b*c - a*d)^2*g*i^2) + (2*A*b*B*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
 - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(
b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[a + b*x]^2*Log[(b*(c + d*x)
)/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*A*b*B*PolyLog[2, -((d*(a + b*x))
/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*PolyLog[2, -((d*(a + b*x))
```

```
/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[a + b*x]*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) + (2*A*b*B*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*Log[(c + d*x)^(-1)]
*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*(L
og[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*Log[(e*(a +
b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*
g*i^2) + (2*b*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*
g*i^2) + (2*b*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i
^2) + (2*b*B^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g*
i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
```

```
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
```

```
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(96c+96dx)^2(ag+bgx)}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g(c+dx)} \cdots\right.$$

$$= \frac{b^2\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{9216(bc-ad)^2g} - \frac{(bd)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{9216(bc-ad)^2g} - \frac{d\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2}\,dx}{9216(bc-ad)g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{9216(bc-}\cdots$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{9216(bc-}\cdots$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{9216(bc-}\cdots$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc-ad)^2g} - \frac{b\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{9216(bc-}\cdots$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)^2g} + \frac{\left(A+B\log\left(\frac{e(a+}{c+}\right.\right.}{9216(bc-ad)g(c}\cdots$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)^2g} + \frac{\left(A+B\log\left(\frac{e(a+}{c+}\right.\right.}{9216(bc-ad)g(c}\cdots$$

$$= -\frac{bB^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc-ad)^2g} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc-ad)g(c+dx)} - \frac{bB\log(a+bx)\left(A+B\,l\right.}{4608(bc-ad)}\cdots$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{bB^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc-ad)^2g} - \frac{bB^2}{}\cdots$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} - \frac{bB^2\log\left(-\frac{bc-ad}{d(a+bx)}\right.}{9216(bc-}\cdots$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log^2(a+bx)}{9216(bc-ad)^2g}\cdots$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log^2(a+bx)}{9216(bc-ad)^2g}\cdots$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log^2(a+bx)}{9216(bc-ad)^2g}\cdots$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log^2(a+bx)}{9216(bc-ad)^2g}\cdots$$

$$= \frac{B^2}{4608(bc-ad)g(c+dx)} + \frac{bB^2\log(a+bx)}{4608(bc-ad)^2g} - \frac{AbB\log^2(a+bx)}{9216(bc-ad)^2g} + \frac{bB^2\log^2(a+bx)}{9216(bc-ad)^2g}\cdots$$

Mathematica [A] time = 0.709266, size = 187, normalized size = 0.87

$$\frac{3b\left(A^2-2AB+2B^2\right)(c+dx)\log(a+bx)-3\left(A^2-2AB+2B^2\right)(ad+b(c+dx)\log(c+dx)-bc)+3B(Ab(c+dx)-Bd(}{3gi^2(c+dx)(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*
x)^2),x]
```

```
[Out] (3*b*(A^2 - 2*A*B + 2*B^2)*(c + d*x)*Log[a + b*x] + 6*(A - B)*B*(b*c - a*d)
*Log[(e*(a + b*x))/(c + d*x)] + 3*B*(-(B*d*(a + b*x)) + A*b*(c + d*x))*Log[
(e*(a + b*x))/(c + d*x)]^2 + b*B^2*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^3
 - 3*(A^2 - 2*A*B + 2*B^2)*(-(b*c) + a*d + b*(c + d*x)*Log[c + d*x]))/(3*(b
*c - a*d)^2*g*i^2*(c + d*x))
```

Maple [B] time = 0.059, size = 1633, normalized size = 7.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] d/i^2/(a*d-b*c)^3/g*A*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-2/i^2/(a*d-b*
c)^3/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-4*d/i^2/(a*d-b*c
)^3/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c+2*d/i^2/(a*d-b*c)^3
/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a*b*c-4*d/i^2/(a*d-b*c)^3/
g*A*B/(d*x+c)*a*b*c-1/3/i^2/(a*d-b*c)^3/g*B^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^3*c-1/i^2/(a*d-b*c)^3/g*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*
d^2/i^2/(a*d-b*c)^3/g*B^2/(d*x+c)*a^2-2/i^2/(a*d-b*c)^3/g*B^2/(d*x+c)*b^2*c
^2-d^2/i^2/(a*d-b*c)^3/g*A^2/(d*x+c)*a^2-1/i^2/(a*d-b*c)^3/g*A^2/(d*x+c)*b^
2*c^2+1/i^2/(a*d-b*c)^3/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c-2/i^2
/(a*d-b*c)^3/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2*d^2/i^2/(a*d-b*c
)^3/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2*d^2/i^2/(a*d-b*c)^3
/g*A*B/(d*x+c)*a^2-2*d/i^2/(a*d-b*c)^3/g*B^2*b*a+2/i^2/(a*d-b*c)^3/g*B^2*b^
2*c+d/i^2/(a*d-b*c)^3/g*A^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-d^2/i^2/(a*
d-b*c)^3/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a^2+1/3*d/i^2/(a*d
-b*c)^3/g*B^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a+2*d/i^2/(a*d-b*c)^3/g*B
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+2/i^2/(a*d-b*c)^3/g*A*B*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*b^2*c-1/i^2/(a*d-b*c)^3/g*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2*c-1/i^2/(a*d-b*c)^3/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d
*x+c)*b^2*c^2+2/i^2/(a*d-b*c)^3/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+
c)*b^2*c^2+2/i^2/(a*d-b*c)^3/g*A*B/(d*x+c)*b^2*c^2-d/i^2/(a*d-b*c)^3/g*B^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*a+4*d/i^2/(a*d-b*c)^3/g*A*B*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c+4*d/i^2/(a*d-b*c)^3/g*B^2/(d*x+c)*a*b*c+
2*d/i^2/(a*d-b*c)^3/g*A^2/(d*x+c)*a*b*c-d/i^2/(a*d-b*c)^3/g*A^2*b*a+1/i^2/(
a*d-b*c)^3/g*A^2*b^2*c-2*d/i^2/(a*d-b*c)^3/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*b*a-2*d^2/i^2/(a*d-b*c)^3/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+
c)*a^2+2*d/i^2/(a*d-b*c)^3/g*A*B*b*a-2/i^2/(a*d-b*c)^3/g*A*B*b^2*c
```

Maxima [B] time = 1.57156, size = 1355, normalized size = 6.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algor
ithm="maxima")
```

```
[Out] B^2*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/(
(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c
*d + a^2*d^2)*g*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 + 2*A*B*(1/((b
*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 -
 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d
^2)*g*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/3*B^2*(3*((b*d*x + b*c
)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x
+ b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x
+ c))*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i
^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2
)*x) - ((b*d*x + b*c)*log(b*x + a)^3 - (b*d*x + b*c)*log(d*x + c)^3 + 3*(b*
d*x + b*c)*log(b*x + a)^2 + 3*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*lo
g(d*x + c)^2 + 6*b*c - 6*a*d + 6*(b*d*x + b*c)*log(b*x + a) - 3*(2*b*d*x +
(b*d*x + b*c)*log(b*x + a)^2 + 2*b*c + 2*(b*d*x + b*c)*log(b*x + a))*log(d*
x + c))/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d*g
*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x)) + A^2*(1/((b*c*d - a*d^2)*g*i
^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*
d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2)) - ((b
*d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d +
 2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a)
)*log(d*x + c))*A*B/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 +
(b^2*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x)
```

Fricas [A] time = 0.521285, size = 510, normalized size = 2.38

$$\frac{\left(B^2bdx + B^2bc\right)\log\left(\frac{bex+ae}{dx+c}\right)^3 + 3\left(A^2 - 2AB + 2B^2\right)bc - 3\left(A^2 - 2AB + 2B^2\right)ad + 3\left(ABbc - B^2ad + \left(AB - B^2\right)bdx\right)}{3\left(\left(b^2c^2d - 2abcd^2 + a^2d^3\right)gi^2x + \left(b^2c^3 - 2abc^2d\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algor
ithm="fricas")
```

```
[Out] 1/3*((B^2*b*d*x + B^2*b*c)*log((b*e*x + a*e)/(d*x + c))^3 + 3*(A^2 - 2*A*B
+ 2*B^2)*b*c - 3*(A^2 - 2*A*B + 2*B^2)*a*d + 3*(A*B*b*c - B^2*a*d + (A*B -
B^2)*b*d*x)*log((b*e*x + a*e)/(d*x + c))^2 + 3*(A^2*b*c + (A^2 - 2*A*B + 2*
B^2)*b*d*x - 2*(A*B - B^2)*a*d)*log((b*e*x + a*e)/(d*x + c)))/((b^2*c^2*d -
 2*a*b*c*d^2 + a^2*d^3)*g*i^2*x + (b^2*c^3 - 2*a*b*c^2*d + a^2*c*d^2)*g*i^2
)
```

Sympy [B] time = 4.92577, size = 539, normalized size = 2.52

$$\frac{B^2b\log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3a^2d^2gi^2 - 6abcdgi^2 + 3b^2c^2gi^2} + \frac{\left(-2AB + 2B^2\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}{acdgi^2 + ad^2gi^2x - bc^2gi^2 - bcdgi^2x} + \left(A^2 - 2AB + 2B^2\right)\left(-\frac{b\log\left(x + \frac{-\frac{a^3bd^3}{(ad-bc)^2} + \frac{3a^2b}{(ad-}\cdots}{\cdots}\right)}{gi^2\,(\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] B**2*b*log(e*(a + b*x)/(c + d*x))**3/(3*a**2*d**2*g*i**2 - 6*a*b*c*d*g*i**2
 + 3*b**2*c**2*g*i**2) + (-2*A*B + 2*B**2)*log(e*(a + b*x)/(c + d*x))/(a*c*
d*g*i**2 + a*d**2*g*i**2*x - b*c**2*g*i**2 - b*c*d*g*i**2*x) + (A**2 - 2*A*
B + 2*B**2)*(-b*log(x + (-a**3*b*d**3/(a*d - b*c)**2 + 3*a**2*b**2*c*d**2/(
a*d - b*c)**2 - 3*a*b**3*c**2*d/(a*d - b*c)**2 + a*b*d + b**4*c**3/(a*d - b
*c)**2 + b**2*c)/(2*b**2*d))/(g*i**2*(a*d - b*c)**2) + b*log(x + (a**3*b*d*
*3/(a*d - b*c)**2 - 3*a**2*b**2*c*d**2/(a*d - b*c)**2 + 3*a*b**3*c**2*d/(a*
d - b*c)**2 + a*b*d - b**4*c**3/(a*d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**
2*(a*d - b*c)**2) - 1/(a*c*d*g*i**2 - b*c**2*g*i**2 + x*(a*d**2*g*i**2 - b*
c*d*g*i**2))) + (A*B*b*c + A*B*b*d*x - B**2*a*d - B**2*b*d*x)*log(e*(a + b*
x)/(c + d*x))**2/(a**2*c*d**2*g*i**2 + a**2*d**3*g*i**2*x - 2*a*b*c**2*d*g*
i**2 - 2*a*b*c*d**2*g*i**2*x + b**2*c**3*g*i**2 + b**2*c**2*d*g*i**2*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)\left(dix+ci\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)*(d*i*x + c*i)
^2), x)
```

3.97 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=365

$$-\frac{b^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i^2(a+bx)(bc-ad)^3}-\frac{2b^2B(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2A\ldots}{g^2i^2(c\ldots}$$

```
[Out] (-2*A*B*d^2*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) + (2*B^2*d^2*(a +
b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B^2*(c + d*x))/((b*c - a*d
)^3*g^2*i^2*(a + b*x)) - (2*B^2*d^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])
/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B*(c + d*x)*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (d^2*(a + b*x)*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (b^2
*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^2*i^2*(
a + b*x)) - (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)
^3*g^2*i^2)
```

Rubi [C] time = 7.17614, antiderivative size = 1521, normalized size of antiderivative = 4.17, number of steps used = 113, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*i*x)^2
),x]
```

```
[Out] (-2*b*B^2)/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (2*B^2*d)/((b*c - a*d)^2*g^2
*i^2*(c + d*x)) - (4*b*B^2*d*Log[a + b*x])/((b*c - a*d)^3*g^2*i^2) + (2*A*b
*B*d*Log[a + b*x]^2)/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*Log[a + b*x]*Log[
(c + d*x)^(-1)]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*Log[-((d*(a + b*x))
/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*
Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a
*d)^3*g^2*i^2) + (2*b*B^2*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((
b*c - a*d)^3*g^2*i^2) - (2*b*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c
- a*d)^2*g^2*i^2*(a + b*x)) + (2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (b*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2)/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (d*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^2)/((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (2*b*d*Log[a + b*x]*(A + B*Log[
(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^2*i^2) + (4*b*B^2*d*Log[c + d
*x])/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*Log[a + b*x]^2*Log[c + d*x])/((b*
c - a*d)^3*g^2*i^2) - (4*A*b*B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
d*x])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-1)]
*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (4*b*B^2*d*Log[-((d*(a + b*x))/(b*
c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x
)])*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (2*b*d*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (2*A*b*B*d*Log[c + d
*x]^2)/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*Log[a + b*x]*Log[c + d*x]^2)/((
b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x
]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*Log[c + d*x]^3)/(3*(b*c - a*d)^3*
g^2*i^2) - (4*A*b*B*d*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c -
```

```
a*d)^3*g^2*i^2) + (2*b*B^2*d*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])
/((b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/((b*c - a*d)^3*g^2*i^2) + (4*b*B^2*d*Log[a + b*x]*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*Log[(c + d*x)^(
-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) + (4*b*
B^2*d*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*P
olyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*
Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b
*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])
/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]
)/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b
*x))])/((b*c - a*d)^3*g^2*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

```
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
```

```
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(97c+97dx)^2(ag+bgx)^2}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)^2} - \frac{2b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^3g^2(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{9409(bc-ad)^2g^2(c}\right.$$

$$= -\frac{(2b^2d)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}dx}{9409(bc-ad)^3g^2} + \frac{(2bd^2)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}dx}{9409(bc-ad)^3g^2} + \frac{b^2\int \frac{\left(A+B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{(a+bx)^2}}{9409(bc-ad)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\,l\right.}{9409(bc-ad)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\,l\right.}{9409(bc-ad)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\,l\right.}{9409(bc-ad)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\,l\right.}{9409(bc-ad)}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(a+bx)} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(a+bx)} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc-ad)^2g^2(a+bx}$$

$$= \frac{2bB^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9409(bc-ad)^3g^2} - \frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc-ad)^2g^2(a+bx)} + \frac{2Bd\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{9409(bc-ad)^2g^2(c}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+bx)}{9409(bc-ad)^3g^2} + \frac{2bB}{}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+bx)}{9409(bc-ad)^3g^2} + \frac{2A}{94}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+bx)}{9409(bc-ad)^3g^2} + \frac{2A}{94}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+bx)}{9409(bc-ad)^3g^2} + \frac{2A}{94}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+bx)}{9409(bc-ad)^3g^2} + \frac{2A}{94}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+bx)}{9409(bc-ad)^3g^2} + \frac{2A}{94}$$

$$= -\frac{2bB^2}{9409(bc-ad)^2g^2(a+bx)} - \frac{2B^2d}{9409(bc-ad)^2g^2(c+dx)} - \frac{4bB^2d\log(a+bx)}{9409(bc-ad)^3g^2} + \frac{2A}{94}$$

Mathematica [A] time = 1.04172, size = 307, normalized size = 0.84

$$-\frac{3B\left(-a^2Bd^2+2abd(A(c+dx)-Bdx)+b^2(2Adx(c+dx)+Bc(c+2dx))\right)\log^2\left(\frac{e(a+bx)}{c+dx}\right)-3d\left(A^2-2AB+2B^2\right)(a+bx)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*
i*x)^2),x]
```

```
[Out] -(-3*(A^2 - 2*A*B + 2*B^2)*d*(-(b*c) + a*d)*(a + b*x) + 3*b*(A^2 + 2*A*B +
2*B^2)*(b*c - a*d)*(c + d*x) + 6*b*(A^2 + 2*B^2)*d*(a + b*x)*(c + d*x)*Log[
a + b*x] + 6*B*(b*c - a*d)*(A*b*c + b*B*c + a*A*d - a*B*d + 2*A*b*d*x)*Log[
(e*(a + b*x))/(c + d*x)] + 3*B*(-(a^2*B*d^2) + 2*a*b*d*(-(B*d*x) + A*(c + d
*x)) + b^2*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)))*Log[(e*(a + b*x))/(c + d*
x)]^2 + 2*b*B^2*d*(a + b*x)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*b*
(A^2 + 2*B^2)*d*(a + b*x)*(c + d*x)*Log[c + d*x])/(3*(b*c - a*d)^3*g^2*i^2*
(a + b*x)*(c + d*x))
```

Maple [B] time = 0.053, size = 2572, normalized size = 7.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] -2*d^3/i^2/(a*d-b*c)^4/g^2*B^2/(d*x+c)*a^2-d^3/i^2/(a*d-b*c)^4/g^2*A^2/(d*x
+c)*a^2+e*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*e*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4*d^2/i^2
/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b*c*a-2*e/i^2/
(a*d-b*c)^4/g^2*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*c+2*d^2/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2/(d*x+c)*b*c*a-2*d/i^2/(a*d-b*c)^4/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*x+c)*b^2*c^2+2*e*d/i^2/(a*d-b*c)^4/g^2*A*B*b^2/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)*a-4*d^2/i^2/(a*d-b*c)^4/g^2*A*B/(d*x+c)*a*b*c+2*d/i^2/(a*
d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-2*d/i^2/(a
*d-b*c)^4/g^2*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+2*d/i^2/(a*d-b*c)
^4/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-2*d^2/i^2/(a*d-b*c)^4/g^2*
A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2*e/i^2/(a*d-b*c)^4/g^2*B^2*b^3/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*d^3/i^
2/(a*d-b*c)^4/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2*d/i^2/(
a*d-b*c)^4/g^2*A*B/(d*x+c)*b^2*c^2+2*d^2/i^2/(a*d-b*c)^4/g^2*A^2/(d*x+c)*a*
b*c-2*e/i^2/(a*d-b*c)^4/g^2*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+4
*d^2/i^2/(a*d-b*c)^4/g^2*B^2/(d*x+c)*a*b*c+2*e*d/i^2/(a*d-b*c)^4/g^2*B^2*b^
2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*d/i^2/(a*d-b*c)^4/g^2*A^2*b^2/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e/i^2/(a*d-b*c)^4/g^2*B^2*b^3/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d/i^2/(a*d-b*
c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b^2*c^2+2*d^2/i^2/(a
*d-b*c)^4/g^2*A*B*b*a-2*d/i^2/(a*d-b*c)^4/g^2*A*B*b^2*c-2*d^2/i^2/(a*d-b*c)
^4/g^2*B^2*b*a-d^2/i^2/(a*d-b*c)^4/g^2*A^2*b*a+d/i^2/(a*d-b*c)^4/g^2*A^2*b^
2*c+d/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c-2*d/i
^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2/3*d^2/i^2/(a
*d-b*c)^4/g^2*B^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a-2*d/i^2/(a*d-b*c)^4
/g^2*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*d^2/i^2/(a*d-b*c)^4/g^2*B^
```

```
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+2*d^2/i^2/(a*d-b*c)^4/g^2*A^2*b*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*a-2/3*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))^3*c-d^3/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2/(d*x+c)*a^2+2*d^3/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*x+c)*a^2-d^2/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^2*b*a-2*d/i^2/(a*d-b*c)^4/g^2*B^2/(d*x+c)*b^2*c^2-e/i^2/(a*d-b*c)^4/
g^2*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-2*e/i^2/(a*d-b*c)^4/g^2*B
^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-d/i^2/(a*d-b*c)^4/g^2*A^2/(d*x
+c)*b^2*c^2+2*d^3/i^2/(a*d-b*c)^4/g^2*A*B/(d*x+c)*a^2+4*d^2/i^2/(a*d-b*c)^4
/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b*c*a+2*e*d/i^2/(a*d-b*c)^
4/g^2*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))*a+2*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2*c+2*d^2/i^2/(a*d-b*c)^4/g^2*A*B*b*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a
```

Maxima [B] time = 1.92064, size = 2693, normalized size = 7.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] -B^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^
2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*
c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 -
3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2))*log(b*e*x/(d*x +
 c) + a*e/(d*x + c))^2 - 2*A*B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2
*c*d^2 + a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^
3*d^3)*g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d
*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2)
 - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*
g^2*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 2/3*B^2*(3*(b^2*c^2 - 2*a*
b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x +
 a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(
d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*
log(b*e*x/(d*x + c) + a*e/(d*x + c))/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g
^2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 -
 3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2
 + (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d
^4*g^2*i^2)*x) + (3*b^2*c^2 - 3*a^2*d^2 + (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d
 + a*b*d^2)*x)*log(b*x + a)^3 + 3*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d
^2)*x)*log(b*x + a)*log(d*x + c)^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*
b*d^2)*x)*log(d*x + c)^3 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + a*b*c
*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a) - 3*(2*b^2*d^2*x^2 + 2*a*b*c*d + (
b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c*d
+ a*b*d^2)*x)*log(d*x + c))/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^2*i^2 +
3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 - 3*a*b^3*
c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2 + (b^4*c
^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^4*g^2*i^
2)*x)) - A^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3
)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x +
 (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x +
 c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2)) - 2*(b^2
*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x
```

```
)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*
x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d
*x + c)^2)*A*B/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^2*i^2 + 3*a^3*b*c^2*d
^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 - 3*a*b^3*c^2*d^2*g^2*i
^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2 + (b^4*c^4*g^2*i^2 -
2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^4*g^2*i^2)*x)
```

Fricas [A] time = 0.558737, size = 1062, normalized size = 2.91

$$\frac{12\,ABabcd - 3\left(A^2 + 2\,AB + 2\,B^2\right)b^2c^2 + 3\left(A^2 - 2\,AB + 2\,B^2\right)a^2d^2 - 2\left(B^2b^2d^2x^2 + B^2abcd + \left(B^2b^2cd + B^2abd^2\right)x\right)\log\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] 1/3*(12*A*B*a*b*c*d - 3*(A^2 + 2*A*B + 2*B^2)*b^2*c^2 + 3*(A^2 - 2*A*B + 2*
B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + B^2*a*b*c*d + (B^2*b^2*c*d + B^2*a*b*d^
2)*x)*log((b*e*x + a*e)/(d*x + c))^3 - 3*(2*A*B*b^2*d^2*x^2 + B^2*b^2*c^2 +
 2*A*B*a*b*c*d - B^2*a^2*d^2 + 2*((A*B + B^2)*b^2*c*d + (A*B - B^2)*a*b*d^2
)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 6*((A^2 + 2*B^2)*b^2*c*d - (A^2 + 2*B
^2)*a*b*d^2)*x - 6*((A^2 + 2*B^2)*b^2*d^2*x^2 + A^2*a*b*c*d + (A*B + B^2)*b
^2*c^2 - (A*B - B^2)*a^2*d^2 + ((A^2 + 2*A*B + 2*B^2)*b^2*c*d + (A^2 - 2*A*
B + 2*B^2)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^4*c^3*d - 3*a*b^3*
c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*i^2*x^2 + (b^4*c^4 - 2*a*b^3*c^3
*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^2*i^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*
a^3*b*c^2*d^2 - a^4*c*d^3)*g^2*i^2)
```

Sympy [B] time = 11.0714, size = 1404, normalized size = 3.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)
```

```
[Out] 2*B**2*b*d*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g**2*i**2 - 9*a**2*b*
c*d**2*g**2*i**2 + 9*a*b**2*c**2*d*g**2*i**2 - 3*b**3*c**3*g**2*i**2) - 2*b
*d*(A**2 + 2*B**2)*log(x + (2*A**2*a*b*d**2 + 2*A**2*b**2*c*d + 4*B**2*a*b*
d**2 + 4*B**2*b**2*c*d - 2*a**4*b*d**5*(A**2 + 2*B**2)/(a*d - b*c)**3 + 8*a
**3*b**2*c*d**4*(A**2 + 2*B**2)/(a*d - b*c)**3 - 12*a**2*b**3*c**2*d**3*(A*
*2 + 2*B**2)/(a*d - b*c)**3 + 8*a*b**4*c**3*d**2*(A**2 + 2*B**2)/(a*d - b*c
)**3 - 2*b**5*c**4*d*(A**2 + 2*B**2)/(a*d - b*c)**3)/(4*A**2*b**2*d**2 + 8*
B**2*b**2*d**2))/(g**2*i**2*(a*d - b*c)**3) + 2*b*d*(A**2 + 2*B**2)*log(x +
 (2*A**2*a*b*d**2 + 2*A**2*b**2*c*d + 4*B**2*a*b*d**2 + 4*B**2*b**2*c*d + 2
*a**4*b*d**5*(A**2 + 2*B**2)/(a*d - b*c)**3 - 8*a**3*b**2*c*d**4*(A**2 + 2*
B**2)/(a*d - b*c)**3 + 12*a**2*b**3*c**2*d**3*(A**2 + 2*B**2)/(a*d - b*c)**
3 - 8*a*b**4*c**3*d**2*(A**2 + 2*B**2)/(a*d - b*c)**3 + 2*b**5*c**4*d*(A**2
 + 2*B**2)/(a*d - b*c)**3)/(4*A**2*b**2*d**2 + 8*B**2*b**2*d**2))/(g**2*i**
2*(a*d - b*c)**3) + (-2*A*B*a*d - 2*A*B*b*c - 4*A*B*b*d*x + 2*B**2*a*d - 2*
B**2*b*c)*log(e*(a + b*x)/(c + d*x))/(a**3*c*d**2*g**2*i**2 + a**3*d**3*g**
2*i**2*x - 2*a**2*b*c**2*d*g**2*i**2 - a**2*b*c*d**2*g**2*i**2*x + a**2*b*d
```

```
**3*g**2*i**2*x**2 + a*b**2*c**3*g**2*i**2 - a*b**2*c**2*d*g**2*i**2*x - 2*
a*b**2*c*d**2*g**2*i**2*x**2 + b**3*c**3*g**2*i**2*x + b**3*c**2*d*g**2*i**
2*x**2) + (2*A*B*a*b*c*d + 2*A*B*a*b*d**2*x + 2*A*B*b**2*c*d*x + 2*A*B*b**2
*d**2*x**2 - B**2*a**2*d**2 - 2*B**2*a*b*d**2*x + B**2*b**2*c**2 + 2*B**2*b
**2*c*d*x)*log(e*(a + b*x)/(c + d*x))**2/(a**4*c*d**3*g**2*i**2 + a**4*d**4
*g**2*i**2*x - 3*a**3*b*c**2*d**2*g**2*i**2 - 2*a**3*b*c*d**3*g**2*i**2*x +
 a**3*b*d**4*g**2*i**2*x**2 + 3*a**2*b**2*c**3*d*g**2*i**2 - 3*a**2*b**2*c*
d**3*g**2*i**2*x**2 - a*b**3*c**4*g**2*i**2 + 2*a*b**3*c**3*d*g**2*i**2*x +
 3*a*b**3*c**2*d**2*g**2*i**2*x**2 - b**4*c**4*g**2*i**2*x - b**4*c**3*d*g*
*2*i**2*x**2) - (A**2*a*d + A**2*b*c - 2*A*B*a*d + 2*A*B*b*c + 2*B**2*a*d +
 2*B**2*b*c + x*(2*A**2*b*d + 4*B**2*b*d))/(a**3*c*d**2*g**2*i**2 - 2*a**2*
b*c**2*d*g**2*i**2 + a*b**2*c**3*g**2*i**2 + x**2*(a**2*b*d**3*g**2*i**2 -
2*a*b**2*c*d**2*g**2*i**2 + b**3*c**2*d*g**2*i**2) + x*(a**3*d**3*g**2*i**2
 - a**2*b*c*d**2*g**2*i**2 - a*b**2*c**2*d*g**2*i**2 + b**3*c**3*g**2*i**2)
)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^2(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^2*(d*i*x + c*
i)^2), x)
```

3.98 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=523

$$-\frac{b^3(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3i^2(a+bx)^2(bc-ad)^4}-\frac{b^3B(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^3i^2(a+bx)(bc-ad)^4}+\frac{6b^2Bd(\cdots}{\cdots}$$

```
[Out] (2*A*B*d^3*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) - (2*B^2*d^3*(a + b
*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (6*b^2*B^2*d*(c + d*x))/((b*c - a*
d)^4*g^3*i^2*(a + b*x)) - (b^3*B^2*(c + d*x)^2)/(4*(b*c - a*d)^4*g^3*i^2*(a
 + b*x)^2) + (2*B^2*d^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d
)^4*g^3*i^2*(c + d*x)) + (6*b^2*B*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c +
 d*x)]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*(c + d*x)^2*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2) - (d^3*(a
+ b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^3*i^2*(c +
d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c -
a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c +
d*x)])^2)/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2) + (b*d^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^3)/(B*(b*c - a*d)^4*g^3*i^2)
```

Rubi [C] time = 8.45885, antiderivative size = 2071, normalized size of antiderivative = 3.96, number of steps used = 143, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*i*x)^2
),x]
```

```
[Out] -(b*B^2)/(4*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (11*b*B^2*d)/(2*(b*c - a*d
)^3*g^3*i^2*(a + b*x)) + (2*B^2*d^2)/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (1
5*b*B^2*d^2*Log[a + b*x])/(2*(b*c - a*d)^4*g^3*i^2) - (3*A*b*B*d^2*Log[a +
b*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[a + b*x]^2)/(2*(b*c - a*
d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*
d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x
)^(-1)]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[-((b*c - a*d)/(d*(a +
 b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2
*d^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^3*i^2) -
 (b*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^3*i^2*(a + b
*x)^2) + (5*b*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^3*
i^2*(a + b*x)) - (2*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d
)^3*g^3*i^2*(c + d*x)) + (3*b*B*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/((b*c - a*d)^4*g^3*i^2) - (b*(A + B*Log[(e*(a + b*x))/(c + d*x)
])^2)/(2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (2*b*d*(A + B*Log[(e*(a + b*x
))/(c + d*x)])^2)/((b*c - a*d)^3*g^3*i^2*(a + b*x)) + (d^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*d^2*Log[a
+ b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^3*i^2) - (1
5*b*B^2*d^2*Log[c + d*x])/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[a +
b*x]^2*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*Log[-((d*(a + b
*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log
```

```
[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) + (6*b
*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b*c - a*d)^4*g^3*
i^2) - (6*b*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(
c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^4
*g^3*i^2) - (3*b*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(
(b*c - a*d)^4*g^3*i^2) - (3*b*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Lo
g[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*A*b*B*d^2*Log[c + d*x]^2)/((b*c -
a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) +
(3*b*B^2*d^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^
2*d^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2)
- (b*B^2*d^2*Log[c + d*x]^3)/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*Log[a +
 b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^
2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) - (3
*b*B^2*d^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^
3*i^2) + (6*A*b*B*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d
)^4*g^3*i^2) + (3*b*B^2*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c
 - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(
b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*Log[(c + d*x)^(-
1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) - (6*b*B
^2*d^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d
^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/
((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*
d))])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*PolyLog[3, (b*(c + d*x))/(b*c
- a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*PolyLog[3, 1 + (b*c - a*d)/
(d*(a + b*x))])/((b*c - a*d)^4*g^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
```

```
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
```

```
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
```

```
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(98c+98dx)^2(ag+bgx)^3}\,dx = \int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc-ad)^2g^3(a+bx)^3} - \frac{b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d^2\left(A+B\log\left(\frac{e(a+b\cdots}{c+d\cdots}\right.\right.}{9604(bc-ad)^4g^3(a+\cdots}\right.$$

$$= \frac{\left(3b^2d^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}dx}{9604(bc-ad)^4g^3} - \frac{\left(3bd^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}dx}{9604(bc-ad)^4g^3} - \frac{\left(b^2d\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{(a+bx)^2}}{4802(bc-ad)^3g^3\cdots}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc-ad)^3g^3(c+dx)}\cdots$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc-ad)^3g^3(c+dx)}\cdots$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc-ad)^3g^3(c+dx)}\cdots$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc-ad)^3g^3(c+dx)}\cdots$$

$$= -\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{5bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9604(bc-ad)^3g^3(a+bx)} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{5bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9604(bc-ad)^3g^3(a+bx)} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{3bB^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9604(bc-ad)^4g^3} - \frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc-ad)^2g^3(a+bx)^2} + \frac{5bBd\left(A+B\log\left(\cdots\right.\right.}{9604(bc-ad)^3g^3\cdots}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{B^2d^2}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{B^2d^2}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{B^2d^2}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{B^2d^2}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{B^2d^2}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{B^2d^2}{4802(bc-ad)^3g^3(c+dx\cdots}$$

$$= -\frac{bB^2}{38416(bc-ad)^2g^3(a+bx)^2} + \frac{11bB^2d}{19208(bc-ad)^3g^3(a+bx)} + \frac{B^2d^2}{4802(bc-ad)^3g^3(c+dx\cdots}$$

Mathematica [A] time = 1.44719, size = 466, normalized size = 0.89

$$-2B\left(-6a^2bd^2(A(c+dx)-Bdx)+2a^3Bd^3-6ab^2d(2Adx(c+dx)+Bc(c+2dx))+b^3\left(B\left(-3c^2dx+c^3-9cd^2x^2-3d^3\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*
i*x)^2),x]
```

```
[Out] (4*(A^2 - 2*A*B + 2*B^2)*d^2*(b*c - a*d)*(a + b*x)^2 - b*(2*A^2 + 2*A*B + B
^2)*(b*c - a*d)^2*(c + d*x) + 2*b*(4*A^2 + 10*A*B + 11*B^2)*d*(b*c - a*d)*(
a + b*x)*(c + d*x) + 6*b*(2*A^2 + 2*A*B + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)*
Log[a + b*x] + 2*B*(b*c - a*d)*(4*(A - B)*d^2*(a + b*x)^2 - b*(2*A + B)*(b*
c - a*d)*(c + d*x) + 2*b*(4*A + 5*B)*d*(a + b*x)*(c + d*x))*Log[(e*(a + b*x
))/(c + d*x)] - 2*B*(2*a^3*B*d^3 - 6*a^2*b*d^2*(-(B*d*x) + A*(c + d*x)) - 6
*a*b^2*d*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)) + b^3*(-6*A*d^2*x^2*(c + d*x
) + B*(c^3 - 3*c^2*d*x - 9*c*d^2*x^2 - 3*d^3*x^3)))*Log[(e*(a + b*x))/(c +
d*x)]^2 + 4*b*B^2*d^2*(a + b*x)^2*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^3
- 6*b*(2*A^2 + 2*A*B + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)*Log[c + d*x])/(4*(b
*c - a*d)^4*g^3*i^2*(a + b*x)^2*(c + d*x))
```

Maple [B] time = 0.061, size = 3538, normalized size = 6.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] -d^4/i^2/(a*d-b*c)^5/g^3*A^2/(d*x+c)*a^2-3*e*d/i^2/(a*d-b*c)^5/g^3*A^2*b^3/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+6*e*d^2/i^2/(a*d-b*c)^5/g^3*B^2*b^2/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-6*e*d/i^2/(a*d-b*c)^5/g^3*B^2*b^3/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3*d^3/i^2/(a*d-b*c)^5/g^3*A*B*b*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2*a-3*d^2/i^2/(a*d-b*c)^5/g^3*A*B*b^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2*c+2*d^2/i^2/(a*d-b*c)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))/(d*x+c)*b^2*c^2+1/2*e^2/i^2/(a*d-b*c)^5/g^3*B^2*b^4/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-d^2/i^2/(a*d-b*c)
^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b^2*c^2-2*d^3/i^2/(a*d
-b*c)^5/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2*d^4/i^2/(a*d-b*c)^5/g
^3*B^2/(d*x+c)*a^2+2*d^3/i^2/(a*d-b*c)^5/g^3*A*B*b*a-2*d^2/i^2/(a*d-b*c)^5/
g^3*A*B*b^2*c+2*d^2/i^2/(a*d-b*c)^5/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*b^2*c+1/2*e^2/i^2/(a*d-b*c)^5/g^3*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b
*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-2*d^4/i^2/(a*d-b*c)^5/g^3*A*B*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+4*d^3/i^2/(a*d-b*c)^5/g^3*B^2/(d*x
+c)*a*b*c+1/2*e^2/i^2/(a*d-b*c)^5/g^3*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^2*c+2*d^3/i^2/(a*d-b*c)^5/g^3*A^2/(d*x+c)*a*b*c-1/2*e^2*d/i^2/(a*d-b
*c)^5/g^3*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2*d/i^2/(a*
d-b*c)^5/g^3*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+3*e*d^2/i^2/(a
*d-b*c)^5/g^3*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+d^3/i^2/(a*d-b*
c)^5/g^3*B^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a-d^2/i^2/(a*d-b*c)^5/g^3*
B^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*c+2*d^2/i^2/(a*d-b*c)^5/g^3*A*B/(
d*x+c)*b^2*c^2+3*d^3/i^2/(a*d-b*c)^5/g^3*A^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*a-3*d^2/i^2/(a*d-b*c)^5/g^3*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-d
^4/i^2/(a*d-b*c)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a^2-d^
3/i^2/(a*d-b*c)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*a+d^2/i^2/(a*
```

```
d-b*c)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c+2*d^3/i^2/(a*d-b*c
)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2*d^2/i^2/(a*d-b*c)^5/g^3*B
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2*d^4/i^2/(a*d-b*c)^5/g^3*A*B/(d*x
+c)*a^2+1/2*e^2/i^2/(a*d-b*c)^5/g^3*A^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*
b*c)^2*c-d^2/i^2/(a*d-b*c)^5/g^3*A^2/(d*x+c)*b^2*c^2+1/4*e^2/i^2/(a*d-b*c)^
5/g^3*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-2*d^2/i^2/(a*d-b*c)^5
/g^3*B^2/(d*x+c)*b^2*c^2+2*d^4/i^2/(a*d-b*c)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))/(d*x+c)*a^2-d^3/i^2/(a*d-b*c)^5/g^3*A^2*b*a+d^2/i^2/(a*d-b*c)^5
/g^3*A^2*b^2*c-2*d^3/i^2/(a*d-b*c)^5/g^3*B^2*b*a+2*d^2/i^2/(a*d-b*c)^5/g^3*
B^2*b^2*c-e^2*d/i^2/(a*d-b*c)^5/g^3*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*
b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*d^3/i^2/(a*d-b*c)^5/g^3*A*B*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b*c*a+6*e*d^2/i^2/(a*d-b*c)^5/g^3*A*B*b
^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-6*
e*d/i^2/(a*d-b*c)^5/g^3*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*c-6*e*d/i^2/(a*d-b*c)^5/g^3*A*B*b^3/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)*c-1/2*e^2*d/i^2/(a*d-b*c)^5/g^3*B^2*b^3/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-3*e*d/i^2/(a*d-b
*c)^5/g^3*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2*c+6*e*d^2/i^2/(a*d-b*c)^5/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4*d^3/i^2/(a*d-b*c)^5/g^3*A*B
/(d*x+c)*a*b*c-4*d^3/i^2/(a*d-b*c)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*x+c)*b*c*a-2*d^2/i^2/(a*d-b*c)^5/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*x+c)*b^2*c^2-1/2*e^2*d/i^2/(a*d-b*c)^5/g^3*B^2*b^3/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-6*e*d/i^2/(a*d-b*c)
^5/g^3*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*c+3*e*d^2/i^2/(a*d-b*c)^5/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+e^2/i^2/(a*d-b*c)^5/g^3*A*B*b^4/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*d
^3/i^2/(a*d-b*c)^5/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b*c*a-
1/2*e^2*d/i^2/(a*d-b*c)^5/g^3*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2
*a+6*e*d^2/i^2/(a*d-b*c)^5/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*
a
```

Maxima [B] time = 3.15548, size = 5652, normalized size = 10.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] 1/2*B^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*
a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*
g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3
- 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2
*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d +
3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*
a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d
^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d
^3 + a^4*d^4)*g^3*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 + A*B*((6*b^
2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((
b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 +
(b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)
*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c
*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^
2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d +
```

```
6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x + c
)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*
g^3*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/4*B^2*(2*(b^3*c^3 - 12*a
*b^2*c^2*d + 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6
*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^
2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^
2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3
*b^3*c^2*d - 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 +
(b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)
 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*
c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*
d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*log(b
*e*x/(d*x + c) + a*e/(d*x + c))/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*
i^2 + 6*a^4*b^2*c^3*d^2*g^3*i^2 - 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i
^2 + (b^6*c^4*d*g^3*i^2 - 4*a*b^5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i
^2 - 4*a^3*b^3*c*d^4*g^3*i^2 + a^4*b^2*d^5*g^3*i^2)*x^3 + (b^6*c^5*g^3*i^2
- 2*a*b^5*c^4*d*g^3*i^2 - 2*a^2*b^4*c^3*d^2*g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3
*i^2 - 7*a^4*b^2*c*d^4*g^3*i^2 + 2*a^5*b*d^5*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^
3*i^2 - 7*a^2*b^4*c^4*d*g^3*i^2 + 8*a^3*b^3*c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2
*d^3*g^3*i^2 - 2*a^5*b*c*d^4*g^3*i^2 + a^6*d^5*g^3*i^2)*x) + (b^3*c^3 - 24*
a*b^2*c^2*d + 15*a^2*b*c*d^2 + 8*a^3*d^3 - 4*(b^3*d^3*x^3 + a^2*b*c*d^2 + (
b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^
3 + 4*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2
*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^3 - 30*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*
(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2
 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2
 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*
b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*lo
g(b*x + a))*log(d*x + c)^2 - 3*(7*b^3*c^2*d + 6*a*b^2*c*d^2 - 13*a^2*b*d^3)
*x - 30*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b
^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(5*b^3*d^3*x^3 + 5*a^2*b*c*d^2 +
5*(b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2
 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 5*(2*
a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*
a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))
/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 + 6*a^4*b^2*c^3*d^2*g^3*i^2
 - 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (b^6*c^4*d*g^3*i^2 - 4*a*b
^5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4*a^3*b^3*c*d^4*g^3*i^2 +
a^4*b^2*d^5*g^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*b^5*c^4*d*g^3*i^2 - 2*a^2
*b^4*c^3*d^2*g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 - 7*a^4*b^2*c*d^4*g^3*i^2
+ 2*a^5*b*d^5*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2 - 7*a^2*b^4*c^4*d*g^3*i^2
 + 8*a^3*b^3*c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g^3*i^2 - 2*a^5*b*c*d^4*g^
3*i^2 + a^6*d^5*g^3*i^2)*x)) + 1/2*A^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*
d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 +
3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2
*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 -
5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a
^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*
d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*
d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d +
6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2)) - 1/2*(b^3*c^3 - 12*
a*b^2*c^2*d + 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 +
6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d
^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d
^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(
3*b^3*c^2*d - 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 +
 (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a
) + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2
*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2
```

```
*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*A*B/
(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 + 6*a^4*b^2*c^3*d^2*g^3*i^2
- 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (b^6*c^4*d*g^3*i^2 - 4*a*b^
5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4*a^3*b^3*c*d^4*g^3*i^2 + a
^4*b^2*d^5*g^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*b^5*c^4*d*g^3*i^2 - 2*a^2*
b^4*c^3*d^2*g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 - 7*a^4*b^2*c*d^4*g^3*i^2 +
 2*a^5*b*d^5*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2 - 7*a^2*b^4*c^4*d*g^3*i^2
+ 8*a^3*b^3*c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g^3*i^2 - 2*a^5*b*c*d^4*g^3
*i^2 + a^6*d^5*g^3*i^2)*x)
```

Fricas [A] time = 0.590522, size = 2061, normalized size = 3.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] -1/4*((2*A^2 + 2*A*B + B^2)*b^3*c^3 - 12*(A^2 + 2*A*B + 2*B^2)*a*b^2*c^2*d
+ 3*(2*A^2 + 10*A*B + 5*B^2)*a^2*b*c*d^2 + 4*(A^2 - 2*A*B + 2*B^2)*a^3*d^3
- 4*(B^2*b^3*d^3*x^3 + B^2*a^2*b*c*d^2 + (B^2*b^3*c*d^2 + 2*B^2*a*b^2*d^3)*
x^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c))^3
 - 6*((2*A^2 + 2*A*B + 5*B^2)*b^3*c*d^2 - (2*A^2 + 2*A*B + 5*B^2)*a*b^2*d^3
)*x^2 - 2*(3*(2*A*B + B^2)*b^3*d^3*x^3 - B^2*b^3*c^3 + 6*B^2*a*b^2*c^2*d +
6*A*B*a^2*b*c*d^2 - 2*B^2*a^3*d^3 + 3*(4*A*B*a*b^2*d^3 + (2*A*B + 3*B^2)*b^
3*c*d^2)*x^2 + 3*(B^2*b^3*c^2*d + 4*(A*B + B^2)*a*b^2*c*d^2 + 2*(A*B - B^2)
*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 3*((2*A^2 + 6*A*B + 7*B^2)*
b^3*c^2*d + 2*(2*A^2 - 2*A*B + 3*B^2)*a*b^2*c*d^2 - (6*A^2 + 2*A*B + 13*B^2
)*a^2*b*d^3)*x - 2*(3*(2*A^2 + 2*A*B + 5*B^2)*b^3*d^3*x^3 + 6*A^2*a^2*b*c*d
^2 - (2*A*B + B^2)*b^3*c^3 + 12*(A*B + B^2)*a*b^2*c^2*d - 4*(A*B - B^2)*a^3
*d^3 + 3*((2*A^2 + 6*A*B + 7*B^2)*b^3*c*d^2 + 4*(A^2 + 2*B^2)*a*b^2*d^3)*x^
2 + 3*((2*A*B + 3*B^2)*b^3*c^2*d + 4*(A^2 + 2*A*B + 2*B^2)*a*b^2*c*d^2 + 2*
(A^2 - 2*A*B + 2*B^2)*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^6*c^4
*d - 4*a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a^4*b^2*d^5)*g
^3*i^2*x^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^3*b^3*c^2*d
^3 - 7*a^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*i^2*x^2 + (2*a*b^5*c^5 - 7*a^2*b^4*
c^4*d + 8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*d^5)*g^
3*i^2*x + (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c^2*
d^3 + a^6*c*d^4)*g^3*i^2)
```

Sympy [B] time = 65.5382, size = 2683, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**2,x)
```

```
[Out] B**2*b*d**2*log(e*(a + b*x)/(c + d*x))**3/(a**4*d**4*g**3*i**2 - 4*a**3*b*c
*d**3*g**3*i**2 + 6*a**2*b**2*c**2*d**2*g**3*i**2 - 4*a*b**3*c**3*d*g**3*i*
*2 + b**4*c**4*g**3*i**2) - 3*b*d**2*(2*A**2 + 2*A*B + 5*B**2)*log(x + (6*A
**2*a*b*d**3 + 6*A**2*b**2*c*d**2 + 6*A*B*a*b*d**3 + 6*A*B*b**2*c*d**2 + 15
*B**2*a*b*d**3 + 15*B**2*b**2*c*d**2 - 3*a**5*b*d**7*(2*A**2 + 2*A*B + 5*B*
```

```
*2)/(a*d - b*c)**4 + 15*a**4*b**2*c*d**6*(2*A**2 + 2*A*B + 5*B**2)/(a*d - b
*c)**4 - 30*a**3*b**3*c**2*d**5*(2*A**2 + 2*A*B + 5*B**2)/(a*d - b*c)**4 +
30*a**2*b**4*c**3*d**4*(2*A**2 + 2*A*B + 5*B**2)/(a*d - b*c)**4 - 15*a*b**5
*c**4*d**3*(2*A**2 + 2*A*B + 5*B**2)/(a*d - b*c)**4 + 3*b**6*c**5*d**2*(2*A
**2 + 2*A*B + 5*B**2)/(a*d - b*c)**4)/(12*A**2*b**2*d**3 + 12*A*B*b**2*d**3
 + 30*B**2*b**2*d**3))/(2*g**3*i**2*(a*d - b*c)**4) + 3*b*d**2*(2*A**2 + 2*
A*B + 5*B**2)*log(x + (6*A**2*a*b*d**3 + 6*A**2*b**2*c*d**2 + 6*A*B*a*b*d**
3 + 6*A*B*b**2*c*d**2 + 15*B**2*a*b*d**3 + 15*B**2*b**2*c*d**2 + 3*a**5*b*d
**7*(2*A**2 + 2*A*B + 5*B**2)/(a*d - b*c)**4 - 15*a**4*b**2*c*d**6*(2*A**2
+ 2*A*B + 5*B**2)/(a*d - b*c)**4 + 30*a**3*b**3*c**2*d**5*(2*A**2 + 2*A*B +
 5*B**2)/(a*d - b*c)**4 - 30*a**2*b**4*c**3*d**4*(2*A**2 + 2*A*B + 5*B**2)/
(a*d - b*c)**4 + 15*a*b**5*c**4*d**3*(2*A**2 + 2*A*B + 5*B**2)/(a*d - b*c)*
*4 - 3*b**6*c**5*d**2*(2*A**2 + 2*A*B + 5*B**2)/(a*d - b*c)**4)/(12*A**2*b*
*2*d**3 + 12*A*B*b**2*d**3 + 30*B**2*b**2*d**3))/(2*g**3*i**2*(a*d - b*c)**
4) + (-4*A*B*a**2*d**2 - 10*A*B*a*b*c*d - 18*A*B*a*b*d**2*x + 2*A*B*b**2*c*
*2 - 6*A*B*b**2*c*d*x - 12*A*B*b**2*d**2*x**2 + 4*B**2*a**2*d**2 - 11*B**2*
a*b*c*d - 3*B**2*a*b*d**2*x + B**2*b**2*c**2 - 9*B**2*b**2*c*d*x - 6*B**2*b
**2*d**2*x**2)*log(e*(a + b*x)/(c + d*x))/(2*a**5*c*d**3*g**3*i**2 + 2*a**5
*d**4*g**3*i**2*x - 6*a**4*b*c**2*d**2*g**3*i**2 - 2*a**4*b*c*d**3*g**3*i**
2*x + 4*a**4*b*d**4*g**3*i**2*x**2 + 6*a**3*b**2*c**3*d*g**3*i**2 - 6*a**3*
b**2*c**2*d**2*g**3*i**2*x - 10*a**3*b**2*c*d**3*g**3*i**2*x**2 + 2*a**3*b*
*2*d**4*g**3*i**2*x**3 - 2*a**2*b**3*c**4*g**3*i**2 + 10*a**2*b**3*c**3*d*g
**3*i**2*x + 6*a**2*b**3*c**2*d**2*g**3*i**2*x**2 - 6*a**2*b**3*c*d**3*g**3
*i**2*x**3 - 4*a*b**4*c**4*g**3*i**2*x + 2*a*b**4*c**3*d*g**3*i**2*x**2 + 6
*a*b**4*c**2*d**2*g**3*i**2*x**3 - 2*b**5*c**4*g**3*i**2*x**2 - 2*b**5*c**3
*d*g**3*i**2*x**3) + (6*A*B*a**2*b*c*d**2 + 6*A*B*a**2*b*d**3*x + 12*A*B*a*
b**2*c*d**2*x + 12*A*B*a*b**2*d**3*x**2 + 6*A*B*b**3*c*d**2*x**2 + 6*A*B*b*
*3*d**3*x**3 - 2*B**2*a**3*d**3 - 6*B**2*a**2*b*d**3*x + 6*B**2*a*b**2*c**2
*d + 12*B**2*a*b**2*c*d**2*x - B**2*b**3*c**3 + 3*B**2*b**3*c**2*d*x + 9*B*
*2*b**3*c*d**2*x**2 + 3*B**2*b**3*d**3*x**3)*log(e*(a + b*x)/(c + d*x))**2/
(2*a**6*c*d**4*g**3*i**2 + 2*a**6*d**5*g**3*i**2*x - 8*a**5*b*c**2*d**3*g**
3*i**2 - 4*a**5*b*c*d**4*g**3*i**2*x + 4*a**5*b*d**5*g**3*i**2*x**2 + 12*a*
*4*b**2*c**3*d**2*g**3*i**2 - 4*a**4*b**2*c**2*d**3*g**3*i**2*x - 14*a**4*b
**2*c*d**4*g**3*i**2*x**2 + 2*a**4*b**2*d**5*g**3*i**2*x**3 - 8*a**3*b**3*c
**4*d*g**3*i**2 + 16*a**3*b**3*c**3*d**2*g**3*i**2*x + 16*a**3*b**3*c**2*d*
*3*g**3*i**2*x**2 - 8*a**3*b**3*c*d**4*g**3*i**2*x**3 + 2*a**2*b**4*c**5*g*
*3*i**2 - 14*a**2*b**4*c**4*d*g**3*i**2*x - 4*a**2*b**4*c**3*d**2*g**3*i**2
*x**2 + 12*a**2*b**4*c**2*d**3*g**3*i**2*x**3 + 4*a*b**5*c**5*g**3*i**2*x -
 4*a*b**5*c**4*d*g**3*i**2*x**2 - 8*a*b**5*c**3*d**2*g**3*i**2*x**3 + 2*b**
6*c**5*g**3*i**2*x**2 + 2*b**6*c**4*d*g**3*i**2*x**3) - (4*A**2*a**2*d**2 +
 10*A**2*a*b*c*d - 2*A**2*b**2*c**2 - 8*A*B*a**2*d**2 + 22*A*B*a*b*c*d - 2*
A*B*b**2*c**2 + 8*B**2*a**2*d**2 + 23*B**2*a*b*c*d - B**2*b**2*c**2 + x**2*
(12*A**2*b**2*d**2 + 12*A*B*b**2*d**2 + 30*B**2*b**2*d**2) + x*(18*A**2*a*b
*d**2 + 6*A**2*b**2*c*d + 6*A*B*a*b*d**2 + 18*A*B*b**2*c*d + 39*B**2*a*b*d*
*2 + 21*B**2*b**2*c*d))/(4*a**5*c*d**3*g**3*i**2 - 12*a**4*b*c**2*d**2*g**3
*i**2 + 12*a**3*b**2*c**3*d*g**3*i**2 - 4*a**2*b**3*c**4*g**3*i**2 + x**3*(
4*a**3*b**2*d**4*g**3*i**2 - 12*a**2*b**3*c*d**3*g**3*i**2 + 12*a*b**4*c**2
*d**2*g**3*i**2 - 4*b**5*c**3*d*g**3*i**2) + x**2*(8*a**4*b*d**4*g**3*i**2
- 20*a**3*b**2*c*d**3*g**3*i**2 + 12*a**2*b**3*c**2*d**2*g**3*i**2 + 4*a*b*
*4*c**3*d*g**3*i**2 - 4*b**5*c**4*g**3*i**2) + x*(4*a**5*d**4*g**3*i**2 - 4
*a**4*b*c*d**3*g**3*i**2 - 12*a**3*b**2*c**2*d**2*g**3*i**2 + 20*a**2*b**3*
c**3*d*g**3*i**2 - 8*a*b**4*c**4*g**3*i**2))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^3(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^3*(d*i*x + c*
i)^2), x)
```

3.99 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=682

$$-\frac{6b^2d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4i^2(a+bx)(bc-ad)^5}-\frac{12b^2Bd^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{b^4(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4i^2(a+bx)^3(bc-ad)^5}-$$

```
[Out] (-2*A*B*d^4*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) + (2*B^2*d^4*(a +
b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B^2*d^2*(c + d*x))/((b*c
- a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B^2*d*(c + d*x)^2)/((b*c - a*d)^5*g^4*i^
2*(a + b*x)^2) - (2*b^4*B^2*(c + d*x)^3)/(27*(b*c - a*d)^5*g^4*i^2*(a + b*x
)^3) - (2*B^2*d^4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^5*g^
4*i^2*(c + d*x)) - (12*b^2*B*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*B*d*(c + d*x)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (2*b^4*B*
(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^5*g^4*i^2*
(a + b*x)^3) + (d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c
 - a*d)^5*g^4*i^2*(c + d*x)) - (6*b^2*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*d*(c + d*x)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2)
- (b^4*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^5
*g^4*i^2*(a + b*x)^3) - (4*b*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3
*B*(b*c - a*d)^5*g^4*i^2)
```

Rubi [C] time = 9.47853, antiderivative size = 2222, normalized size of antiderivative = 3.26, number of steps used = 177, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*i*x)^2
),x]
```

```
[Out] (-2*b*B^2)/(27*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (7*b*B^2*d)/(9*(b*c - a
*d)^3*g^4*i^2*(a + b*x)^2) - (92*b*B^2*d^2)/(9*(b*c - a*d)^4*g^4*i^2*(a + b
*x)) - (2*B^2*d^3)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (110*b*B^2*d^3*Log[a
 + b*x])/(9*(b*c - a*d)^5*g^4*i^2) + (4*A*b*B*d^3*Log[a + b*x]^2)/((b*c - a
*d)^5*g^4*i^2) + (10*b*B^2*d^3*Log[a + b*x]^2)/(3*(b*c - a*d)^5*g^4*i^2) -
(4*b*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^5*g^4*i^2) +
(4*b*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/((b*c
 - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*
(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[a + b*x
]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2) - (2*b*B*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (4*b*
B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^3*g^4*i^2*(a + b*x
)^2) - (26*b*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^4*g
^4*i^2*(a + b*x)) + (2*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c -
a*d)^4*g^4*i^2*(c + d*x)) - (20*b*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(3*(b*c - a*d)^5*g^4*i^2) - (b*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])^2)/(3*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (b*d*(A + B*Log[(e*(a +
```

```
 b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^4*i^2*(a + b*x)^2) - (3*b*d^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^4*i^2*(a + b*x)) - (d^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) -
 (4*b*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)
^5*g^4*i^2) + (110*b*B^2*d^3*Log[c + d*x])/(9*(b*c - a*d)^5*g^4*i^2) - (4*b
*B^2*d^3*Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) - (8*A*b*B*d^
3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) -
 (20*b*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*(b*c - a*
d)^5*g^4*i^2) - (8*b*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])
/((b*c - a*d)^5*g^4*i^2) + (8*b*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*(
Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c +
d*x])/((b*c - a*d)^5*g^4*i^2) + (20*b*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d
*x)])*Log[c + d*x])/(3*(b*c - a*d)^5*g^4*i^2) + (4*b*d^3*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) + (4*A*b*B*d^3*L
og[c + d*x]^2)/((b*c - a*d)^5*g^4*i^2) + (10*b*B^2*d^3*Log[c + d*x]^2)/(3*(
b*c - a*d)^5*g^4*i^2) - (4*b*B^2*d^3*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a
*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/
((b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[c + d*x]^3)/(3*(b*c - a*d)^5*g^4
*i^2) - (8*A*b*B*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a
*d)^5*g^4*i^2) - (20*b*B^2*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])
/(3*(b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[a + b*x]^2*Log[(b*(c + d*x))/
(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) - (8*A*b*B*d^3*PolyLog[2, -((d*(a + b
*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (20*b*B^2*d^3*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))])/(3*(b*c - a*d)^5*g^4*i^2) + (8*b*B^2*d^3*Log[a +
 b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (
8*A*b*B*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2)
- (20*b*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*(b*c - a*d)^5*g^4
*i^2) - (8*b*B^2*d^3*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])/((b*c - a*d)^5*g^4*i^2) + (8*b*B^2*d^3*(Log[a + b*x] + Log[(c + d*x)^(
-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*PolyLo
g[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3
*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (8*b*B
^2*d^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) - (8*
b*B^2*d^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^5*g^4*i^2
)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(99c+99dx)^2(ag+bgx)^4}\,dx = \int\Bigg(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^2g^4(a+bx)^4} - \frac{2b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc-ad)^4g^4(a+bx)^2}$$

$$= -\frac{\left(4b^2d^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{9801(bc-ad)^5g^4} + \frac{\left(4bd^4\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{9801(bc-ad)^5g^4} + \frac{\left(b^2d^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2}\,dx}{3267(bc-ad)^4g^4}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc-ad)^4g^4(a+bx)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc-ad)^4g^4(a+bx)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc-ad)^4g^4(a+bx)}$$

$$= -\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc-ad)^4g^4(a+bx)}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc-ad)^2g^4(a+bx)^3} + \frac{4bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc-ad)^3g^4(a+bx)^2} - \frac{26bBd^2\left(A+B\log\right.}{29403(bc-ad)^4g^4}$$

$$= -\frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc-ad)^2g^4(a+bx)^3} + \frac{4bBd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc-ad)^3g^4(a+bx)^2} - \frac{26bBd^2\left(A+B\log\right.}{29403(bc-ad)^4g^4}$$

$$= \frac{4bB^2d^3\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9801(bc-ad)^5g^4} - \frac{2bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc-ad)^2g^4(a+bx)^3} + \frac{4bBd\left(A+B\log\right.}{29403(bc-ad)^3}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{92bB^2d^2}{88209(bc-ad)^4g^4}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{92bB^2d^2}{88209(bc-ad)^4g^4}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{92bB^2d^2}{88209(bc-ad)^4g^4}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{92bB^2d^2}{88209(bc-ad)^4g^4}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{92bB^2d^2}{88209(bc-ad)^4g^4}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{92bB^2d^2}{88209(bc-ad)^4g^4}$$

$$= -\frac{2bB^2}{264627(bc-ad)^2g^4(a+bx)^3} + \frac{7bB^2d}{88209(bc-ad)^3g^4(a+bx)^2} - \frac{92bB^2d^2}{88209(bc-ad)^4g^4}$$

Mathematica [A] time = 2.10637, size = 613, normalized size = 0.9

$$-\frac{9B\left(18a^2b^2d^2(2Adx(c+dx)+Bc(c+2dx))+12a^3bd^3(A(c+dx)-Bdx)-3a^4Bd^4+6ab^3d\left(6Ad^2x^2(c+dx)+B\left(3c^2dx\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*
i*x)^2),x]
```

```
[Out] -(-27*(A^2 - 2*A*B + 2*B^2)*d^3*(-(b*c) + a*d)*(a + b*x)^3 + b*(9*A^2 + 6*A
*B + 2*B^2)*(b*c - a*d)^3*(c + d*x) - 3*b*(9*A^2 + 12*A*B + 7*B^2)*d*(b*c -
 a*d)^2*(a + b*x)*(c + d*x) + 3*b*(27*A^2 + 78*A*B + 92*B^2)*d^2*(b*c - a*d
)*(a + b*x)^2*(c + d*x) + 6*b*(18*A^2 + 30*A*B + 55*B^2)*d^3*(a + b*x)^3*(c
 + d*x)*Log[a + b*x] + 6*B*(b*c - a*d)*(9*(A - B)*d^3*(a + b*x)^3 + b*(3*A
+ B)*(b*c - a*d)^2*(c + d*x) - 3*b*(3*A + 2*B)*d*(b*c - a*d)*(a + b*x)*(c +
 d*x) + 3*b*(9*A + 13*B)*d^2*(a + b*x)^2*(c + d*x))*Log[(e*(a + b*x))/(c +
d*x)] + 9*B*(-3*a^4*B*d^4 + 12*a^3*b*d^3*(-(B*d*x) + A*(c + d*x)) + 18*a^2*
b^2*d^2*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)) + 6*a*b^3*d*(6*A*d^2*x^2*(c +
 d*x) + B*(-c^3 + 3*c^2*d*x + 9*c*d^2*x^2 + 3*d^3*x^3)) + b^4*(12*A*d^3*x^3
*(c + d*x) + B*(c^4 - 2*c^3*d*x + 6*c^2*d^2*x^2 + 22*c*d^3*x^3 + 10*d^4*x^4
)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 36*b*B^2*d^3*(a + b*x)^3*(c + d*x)*Log
[(e*(a + b*x))/(c + d*x)]^3 - 6*b*(18*A^2 + 30*A*B + 55*B^2)*d^3*(a + b*x)^
3*(c + d*x)*Log[c + d*x])/(27*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3*(c + d*x))
```

Maple [B] time = 0.065, size = 4487, normalized size = 6.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

```
[Out] -2*d^4/i^2/(a*d-b*c)^6/g^4*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+2*d^3/i^
2/(a*d-b*c)^6/g^4*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2/27*e^3*d/i^2/
(a*d-b*c)^6/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/3*e^3/i^2
/(a*d-b*c)^6/g^4*B^2*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))^2*c-2/9*e^3/i^2/(a*d-b*c)^6/g^4*B^2*b^5/(b*e/d+e/(d*x+c
)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+4*d^4/i^2/(a*d-b*c
)^6/g^4*A*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-4*d^3/i^2/(a*d-b*c)^6/g^4
*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-2*d^5/i^2/(a*d-b*c)^6/g^4*A*B*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-d^3/i^2/(a*d-b*c)^6/g^4*B^2*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b^2*c^2+2*d^3/i^2/(a*d-b*c)^6/g^4*B^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-2*d^5/i^2/(a*d-b*c)^6/g^4
*B^2/(d*x+c)*a^2-d^5/i^2/(a*d-b*c)^6/g^4*A^2/(d*x+c)*a^2+2*d^3/i^2/(a*d-b*c
)^6/g^4*B^2*b^2*c-4/3*d^3/i^2/(a*d-b*c)^6/g^4*B^2*b^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^3*c+4*d^4/i^2/(a*d-b*c)^6/g^4*A^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*a+4/3*d^4/i^2/(a*d-b*c)^6/g^4*B^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a
-d^5/i^2/(a*d-b*c)^6/g^4*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a^2+
d^3/i^2/(a*d-b*c)^6/g^4*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c+2*d^4/i
^2/(a*d-b*c)^6/g^4*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2*d^3/i^2/(a*d-b
*c)^6/g^4*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2*d^5/i^2/(a*d-b*c)^6/g
^4*A*B/(d*x+c)*a^2-4*d^3/i^2/(a*d-b*c)^6/g^4*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*c+4*d^4/i^2/(a*d-b*c)^6/g^4*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(
d*x+c)*b*c*a+12*e*d^3/i^2/(a*d-b*c)^6/g^4*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d
*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-12*e*d^2/i^2/(a*d-b*c)^6/g^4*A
```

```
*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
c+2/3*e^3*d/i^2/(a*d-b*c)^6/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A*B*b^3/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*e
^2*d/i^2/(a*d-b*c)^6/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*d^3/i^2/(a*d-b*c)^6/g^4*A*B*b^2*c+d^3/i^2/(
a*d-b*c)^6/g^4*A^2*b^2*c+2*d^4/i^2/(a*d-b*c)^6/g^4*B^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2/(d*x+c)*b*c*a-4*d^4/i^2/(a*d-b*c)^6/g^4*B^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))/(d*x+c)*b*c*a-2/3*e^3/i^2/(a*d-b*c)^6/g^4*A*B*b^5/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*d^3/i^2/(a*
d-b*c)^6/g^4*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2+6*e*d^3/i^
2/(a*d-b*c)^6/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2*a-6*e*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+12*e*d^3/i^2/(a*d-b
*c)^6/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*a-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)^2*a+1/3*e^3*d/i^2/(a*d-b*c)^6/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2/9*e^3*d/i^2/(a*d-b*c
)^6/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*a-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*e^2*d/i^2/(a*d-b*c)^6/g
^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2*c-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*e^2*d/i^2/(a*d-b*c)^6/g^4*B^
2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*c-2*d^4/i^2/(a*d-b*c)^6/g^4*B^2*b*a-d^4/i^2/(a*d-b*c)^6/g^4*A^2*b*a+2*d^3/
i^2/(a*d-b*c)^6/g^4*A*B/(d*x+c)*b^2*c^2-e^2*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+e^2*d/i^2/(a*d-b*c)^6/g^4*B^2*b^4/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A^2*b
^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+2*e^2*d/i^2/(a*d-b*c)^6/g^4*A^2*
b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/3*e^3*d/i^2/(a*d-b*c)^6/g^4*A
^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+12*e*d^3/i^2/(a*d-b*c)^6/g^4
*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-6*e*d^2/i^2/(a*d-b*c)^6/g^4*
A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-12*e*d^2/i^2/(a*d-b*c)^6/g^4*
B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+6*e*d^3/i^2/(a*d-b*c)^6/g^4*A
^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*d^4/i^2/(a*d-b*c)^6/g^4*A^2/
(d*x+c)*a*b*c-2/9*e^3/i^2/(a*d-b*c)^6/g^4*A*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d
*x+c)*b*c)^3*c+4*d^4/i^2/(a*d-b*c)^6/g^4*B^2/(d*x+c)*b*c*a+2*d^4/i^2/(a*d-b
*c)^6/g^4*A*B*b*a-2*d^3/i^2/(a*d-b*c)^6/g^4*B^2/(d*x+c)*b^2*c^2-2/27*e^3/i^
2/(a*d-b*c)^6/g^4*B^2*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+2*d^5/i^2
/(a*d-b*c)^6/g^4*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-4*d^4/i^2/
(a*d-b*c)^6/g^4*A*B/(d*x+c)*a*b*c-12*e*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b*e
/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*e^2*d/i
^2/(a*d-b*c)^6/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+2/9*e^3*
d/i^2/(a*d-b*c)^6/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+12*e*
d^3/i^2/(a*d-b*c)^6/g^4*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-12*e*
d^2/i^2/(a*d-b*c)^6/g^4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-d^3/i
^2/(a*d-b*c)^6/g^4*A^2/(d*x+c)*b^2*c^2-d^4/i^2/(a*d-b*c)^6/g^4*B^2*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^2*b*a-1/3*e^3/i^2/(a*d-b*c)^6/g^4*A^2*b^5/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c
```

Maxima [B] time = 4.42911, size = 8316, normalized size = 12.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, alg
```

orithm="maxima")

```
[Out] -1/3*B^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^
3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11
*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^
4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3
*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 +
 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3
*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d
 + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*
x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 +
a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*
a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) -
12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a
^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(b*e*x/(d*x + c) + a
*e/(d*x + c))^2 - 2/3*A*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a
^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8
*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c
^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*
d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d
^5)*g^4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^
4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 -
 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 +
a^7*d^5)*g^4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4
*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*
a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5
*d^5)*g^4*i^2) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b
^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) - 1/27*B^2*(6*(b^4*c^4 - 9*a*b^3*c^3*d + 54*
a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c*d^3 - a*b^3*d^4)*x
^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4)*x^2 - 18*(b^4*d^4*
x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^
2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 - 18*(b^4*d^4*
x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^
2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x + c)^2 - (5*b^4*c^3*d
 - 81*a*b^3*c^2*d^2 + 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)*x + 30*(b^4*d^4*x^4
+ a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^
4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a) - 6*(5*b^4*d^4*x^4 +
 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^
2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d
^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3
*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x + c))*log(b*e*x/(d*x +
 c) + a*e/(d*x + c))/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*d*g^4*i^2 + 10*a^
5*b^3*c^4*d^2*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7*b*c^2*d^4*g^4*i^
2 - a^8*c*d^5*g^4*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d^2*g^4*i^2 + 10*a
^2*b^6*c^3*d^3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^4*b^4*c*d^5*g^4*i
^2 - a^5*b^3*d^6*g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7*c^5*d*g^4*i^2 -
5*a^2*b^6*c^4*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 25*a^4*b^4*c^2*d^4
*g^4*i^2 + 14*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2)*x^3 + 3*(a*b^7
*c^6*g^4*i^2 - 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*
b^3*c^2*d^4*g^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3
*a^2*b^6*c^6*g^4*i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^
2 - 20*a^5*b^3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*
g^4*i^2 - a^8*d^6*g^4*i^2)*x) + (2*b^4*c^4 - 27*a*b^3*c^3*d + 324*a^2*b^2*c
^2*d^2 - 245*a^3*b*c*d^3 - 54*a^4*d^4 + 330*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 3
6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d
^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^3 - 3
6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d
^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x + c)^3 + 1
```

```
5*(17*b^4*c^2*d^2 + 32*a*b^3*c*d^3 - 49*a^2*b^2*d^4)*x^2 - 90*(b^4*d^4*x^4
+ a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^
4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 - 18*(5*b^4*d^4*x^
4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2
*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*
c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 +
 (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x + c)^2 - (19*b^4*c^
3*d - 567*a*b^3*c^2*d^2 + 87*a^2*b^2*c*d^3 + 461*a^3*b*d^4)*x + 330*(b^4*d^
4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*
b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a) - 6*(55*b^4*d^
4*x^4 + 55*a^3*b*c*d^3 + 55*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 165*(a*b^3*c*d^
3 + a^2*b^2*d^4)*x^2 + 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3
*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^
4)*x)*log(b*x + a)^2 + 55*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 30*(b^4*d^4*x^4
 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d
^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x + c))/(a^3
*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*d^2*g^4*i^2 - 1
0*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*d^5*g^4*i^2 + (
b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3*d^3*g^4*i^2 -
10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b^3*d^6*g^4*i^2)
*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*c^4*d^2*g^4*i^2
 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 + 14*a^5*b^3*c*d
^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i^2 - 4*a^2*b^6*
c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g^4*i^2 + 4*a
^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^6*g^4*i^2 - 14
*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*b^3*c^3*d^3*g^
4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a^8*d^6*g^4*i^2
)*x)) - 1/3*A^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2
 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d
^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4
*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*
b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^
2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*
d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^
4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g
^4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2
*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*
d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*
i^2) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2
 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2)) - 2/9*(b^4*c^4 -
 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*
c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4
)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(
a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x +
 a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(
a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x +
 c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)*
x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^
3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)
- 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(
a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4
*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a
^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x +
c))*A*B/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*d^2
*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*d^5
*g^4*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3*d^
3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b^3*
d^6*g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*c^4
*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 + 14
```

```
*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i^2
- 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g
^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^6*
g^4*i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*b^
3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a^8
*d^6*g^4*i^2)*x)
```

Fricas [B] time = 0.694092, size = 3193, normalized size = 4.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] -1/27*((9*A^2 + 6*A*B + 2*B^2)*b^4*c^4 - 27*(2*A^2 + 2*A*B + B^2)*a*b^3*c^3
*d + 162*(A^2 + 2*A*B + 2*B^2)*a^2*b^2*c^2*d^2 - 5*(18*A^2 + 66*A*B + 49*B^
2)*a^3*b*c*d^3 - 27*(A^2 - 2*A*B + 2*B^2)*a^4*d^4 + 6*((18*A^2 + 30*A*B + 5
5*B^2)*b^4*c*d^3 - (18*A^2 + 30*A*B + 55*B^2)*a*b^3*d^4)*x^3 + 36*(B^2*b^4*
d^4*x^4 + B^2*a^3*b*c*d^3 + (B^2*b^4*c*d^3 + 3*B^2*a*b^3*d^4)*x^3 + 3*(B^2*
a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*x^2 + (3*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*
x)*log((b*e*x + a*e)/(d*x + c))^3 + 3*((18*A^2 + 66*A*B + 85*B^2)*b^4*c^2*d
^2 + 8*(9*A^2 + 6*A*B + 20*B^2)*a*b^3*c*d^3 - (90*A^2 + 114*A*B + 245*B^2)*
a^2*b^2*d^4)*x^2 + 9*(2*(6*A*B + 5*B^2)*b^4*d^4*x^4 + B^2*b^4*c^4 - 6*B^2*a
*b^3*c^3*d + 18*B^2*a^2*b^2*c^2*d^2 + 12*A*B*a^3*b*c*d^3 - 3*B^2*a^4*d^4 +
2*((6*A*B + 11*B^2)*b^4*c*d^3 + 9*(2*A*B + B^2)*a*b^3*d^4)*x^3 + 6*(B^2*b^4
*c^2*d^2 + 6*A*B*a^2*b^2*d^4 + 3*(2*A*B + 3*B^2)*a*b^3*c*d^3)*x^2 - 2*(B^2*
b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 18*(A*B + B^2)*a^2*b^2*c*d^3 - 6*(A*B - B
^2)*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x + c))^2 - ((18*A^2 + 30*A*B + 19*B
^2)*b^4*c^3*d - 81*(2*A^2 + 6*A*B + 7*B^2)*a*b^3*c^2*d^2 - 3*(18*A^2 - 114*
A*B - 29*B^2)*a^2*b^2*c*d^3 + (198*A^2 + 114*A*B + 461*B^2)*a^3*b*d^4)*x +
6*((18*A^2 + 30*A*B + 55*B^2)*b^4*d^4*x^4 + 18*A^2*a^3*b*c*d^3 + (3*A*B + B
^2)*b^4*c^4 - 9*(2*A*B + B^2)*a*b^3*c^3*d + 54*(A*B + B^2)*a^2*b^2*c^2*d^2
- 9*(A*B - B^2)*a^4*d^4 + ((18*A^2 + 66*A*B + 85*B^2)*b^4*c*d^3 + 27*(2*A^2
 + 2*A*B + 5*B^2)*a*b^3*d^4)*x^3 + 3*((6*A*B + 11*B^2)*b^4*c^2*d^2 + 9*(2*A
^2 + 6*A*B + 7*B^2)*a*b^3*c*d^3 + 18*(A^2 + 2*B^2)*a^2*b^2*d^4)*x^2 - ((6*A
*B + 5*B^2)*b^4*c^3*d - 27*(2*A*B + 3*B^2)*a*b^3*c^2*d^2 - 54*(A^2 + 2*A*B
+ 2*B^2)*a^2*b^2*c*d^3 - 18*(A^2 - 2*A*B + 2*B^2)*a^3*b*d^4)*x)*log((b*e*x
+ a*e)/(d*x + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*
a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*i^2*x^4 + (b^8*c^6 - 2
*a*b^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4
+ 14*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*g^4*i^2*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*
c^5*d + 5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6
)*g^4*i^2*x^2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20
*a^5*b^3*c^3*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*i^2*x +
 (a^3*b^5*c^6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 +
 5*a^7*b*c^2*d^4 - a^8*c*d^5)*g^4*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^4(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^4*(d*i*x + c*
i)^2), x)
```

3.100 $\int \frac{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=635

$$\frac{6b^2Bg^3(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^4i^3}+\frac{2b^2B^2g^3(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}-\frac{6b^2B^2g^3(bc-ad)\text{P}}{d}$$

```
[Out] (B^2*(b*c - a*d)*g^3*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (4*A*b*B*(b*c -
 a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) + (4*b*B^2*(b*c - a*d)*g^3*(a + b*
x))/(d^3*i^3*(c + d*x)) - (4*b*B^2*(b*c - a*d)*g^3*(a + b*x)*Log[(e*(a + b*
x))/(c + d*x)])/(d^3*i^3*(c + d*x)) - (B*(b*c - a*d)*g^3*(a + b*x)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) + (2*b^2*B*(b*c - a
*d)*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(d^4*i^3) + (b^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d
^3*i^3) + ((b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
^2)/(2*d^2*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)])^2)/(d^3*i^3*(c + d*x)) + (3*b^2*(b*c - a*d)*g^3*Log[
(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^4*i^3
) + (2*b^2*B^2*(b*c - a*d)*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^
4*i^3) + (6*b^2*B*(b*c - a*d)*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3
*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)
```

Rubi [B] time = 6.24144, antiderivative size = 1890, normalized size of antiderivative = 2.98, number of steps used = 124, number of rules used = 26, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
3,x]
```

```
[Out] (B^2*(b*c - a*d)^3*g^3)/(4*d^4*i^3*(c + d*x)^2) - (9*b*B^2*(b*c - a*d)^2*g^
3)/(2*d^4*i^3*(c + d*x)) - (9*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x])/(2*d^4*
i^3) - (a*b^2*B^2*g^3*Log[a + b*x]^2)/(d^3*i^3) - (5*b^2*B^2*(b*c - a*d)*g^
3*Log[a + b*x]^2)/(2*d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]*Log
[(c + d*x)^(-1)]^2)/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*Log[-((d*(a + b*
x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(d^4*i^3) - (B*(b*c - a*d)^3*g^3*(
A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^4*i^3*(c + d*x)^2) + (5*b*B*(b*c
- a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i^3*(c + d*x)) + (2
*a*b^2*B*g^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^3) +
 (5*b^2*B*(b*c - a*d)*g^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(d^4*i^3) + (b^3*g^3*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i^3)
+ ((b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d^4*i^3*(c
+ d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(d^4*i^3*(c + d*x)) + (9*b^2*B^2*(b*c - a*d)*g^3*Log[c + d*x])/(2*d^4*i^3)
+ (3*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]^2*Log[c + d*x])/(d^4*i^3) + (2*b^
3*B^2*c*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^3) + (6*
A*b^2*B*(b*c - a*d)*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^
4*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
```

```
 + d*x])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]*Log[(c + d*x)^
(-1)]*Log[c + d*x])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*Log[-((d*(a + b*
x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x])/(d^4*i^3) - (2*b^3*B*c*g^3*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])*Log[c + d*x])/(d^4*i^3) - (5*b^2*B*(b*c - a*d)*g^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^4*i^3) - (3*b^2*(b*c - a*d)*g^3
*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/(d^4*i^3) - (b^3*B^2*
c*g^3*Log[c + d*x]^2)/(d^4*i^3) - (3*A*b^2*B*(b*c - a*d)*g^3*Log[c + d*x]^2
)/(d^4*i^3) - (5*b^2*B^2*(b*c - a*d)*g^3*Log[c + d*x]^2)/(2*d^4*i^3) + (3*b
^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]*Log[c + d*x]^2)/(d^4*i^3) - (3*b^2*B^2*
(b*c - a*d)*g^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/(d^4*i^3) - (b
^2*B^2*(b*c - a*d)*g^3*Log[c + d*x]^3)/(d^4*i^3) + (2*a*b^2*B^2*g^3*Log[a +
 b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) + (5*b^2*B^2*(b*c - a*d)*g^
3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) - (3*b^2*B^2*(b*c
- a*d)*g^3*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (2*a*
b^2*B^2*g^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^3) + (5*b^2*B^
2*(b*c - a*d)*g^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) - (6*
b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d)
)])/(d^4*i^3) + (2*b^3*B^2*c*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^
4*i^3) + (6*A*b^2*B*(b*c - a*d)*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/
(d^4*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*Log[(c + d*x)^(-1)]*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*(Log[a + b
*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*PolyLog[3, -((
d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*PolyLog[
3, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
```

```
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(100c+100dx)^3}\,dx = \int \left(\frac{b^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(-bc+ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3(c+dx)^3} + \cdots\right.$$

$$= \frac{\left(b^3g^3\right)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx}{1000000d^3} - \frac{\left(3b^2(bc-ad)g^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,d\cdots}{1000000d^3}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2000000d^4(c+dx)^2} - \frac{3b(bc\cdots}{\cdots}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2000000d^4(c+dx)^2} - \frac{3b(bc\cdots}{\cdots}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2000000d^4(c+dx)^2} - \frac{3b(bc\cdots}{\cdots}$$

$$= \frac{b^3g^3x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1000000d^3} + \frac{(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2000000d^4(c+dx)^2} - \frac{3b(bc\cdots}{\cdots}$$

$$= -\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2000000d^4(c+dx)^2} + \frac{bB(bc-ad)^2g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\cdots\right.}{200000d^4(c+dx)}$$

$$= -\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2000000d^4(c+dx)^2} + \frac{bB(bc-ad)^2g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\cdots\right.}{200000d^4(c+dx)}$$

$$= -\frac{B(bc-ad)^3g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2000000d^4(c+dx)^2} + \frac{bB(bc-ad)^2g^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\cdots\right.}{200000d^4(c+dx)}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

$$= \frac{B^2(bc-ad)^3g^3}{4000000d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3}{2000000d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3\log(a+bx)}{2000000d^4}$$

Mathematica [B] time = 7.81528, size = 6052, normalized size = 9.53

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 2.443, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{3}}{\left(dix+ci\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -3/2*A*B*a^2*b*g^3*(2*(2*d*x + c)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4
*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a
*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^
3*d^2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 -
2*a*b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^
2 - 2*a*b*c*d^3 + a^2*d^4)*i^3)) - 1/2*A^2*b^3*g^3*((6*c^2*d*x + 5*c^3)/(d^
6*i^3*x^2 + 2*c*d^5*i^3*x + c^2*d^4*i^3) - 2*x/(d^3*i^3) + 6*c*log(d*x + c)
/(d^4*i^3)) + 1/2*A*B*a^3*g^3*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i
^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) - 2*log
(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
 + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log
(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 3/2*A^2*a*b^2*g^3*((
4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2*log(d*x +
c)/(d^3*i^3)) - 3/2*(2*d*x + c)*A^2*a^2*b*g^3/(d^4*i^3*x^2 + 2*c*d^3*i^3*x
+ c^2*d^2*i^3) - 1/2*A^2*a^3*g^3/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
- 1/2*(2*((b^3*c*d^2*g^3 - a*b^2*d^3*g^3)*B^2*x^2 + 2*(b^3*c^2*d*g^3 - a*b^
2*c*d^2*g^3)*B^2*x + (b^3*c^3*g^3 - a*b^2*c^2*d*g^3)*B^2)*log(d*x + c)^3 -
(2*B^2*b^3*d^3*g^3*x^3 + 4*B^2*b^3*c*d^2*g^3*x^2 - 2*(2*b^3*c^2*d*g^3 - 6*a
*b^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B^2*x - (5*b^3*c^3*g^3 - 9*a*b^2*c^2*d*g^
3 + 3*a^2*b*c*d^2*g^3 + a^3*d^3*g^3)*B^2)*log(d*x + c)^2)/(d^6*i^3*x^2 + 2*
c*d^5*i^3*x + c^2*d^4*i^3) - integrate(-(3*B^2*a^2*b*d^3*g^3*x*log(e)^2 + B
^2*a^3*d^3*g^3*log(e)^2 + (B^2*b^3*d^3*g^3*log(e)^2 + 2*A*B*b^3*d^3*g^3*log
```

```
(e))*x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e)^2 + 2*A*B*a*b^2*d^3*g^3*log(e))*x^2
+ (B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x +
B^2*a^3*d^3*g^3)*log(b*x + a)^2 + 2*(3*B^2*a^2*b*d^3*g^3*x*log(e) + B^2*a^3
*d^3*g^3*log(e) + (B^2*b^3*d^3*g^3*log(e) + A*B*b^3*d^3*g^3)*x^3 + 3*(B^2*a
*b^2*d^3*g^3*log(e) + A*B*a*b^2*d^3*g^3)*x^2)*log(b*x + a) + (2*(2*b^3*c^2*
d*g^3 - 6*a*b^2*c*d^2*g^3 - 3*(g^3*log(e) - g^3)*a^2*b*d^3)*B^2*x - 2*(A*B*
b^3*d^3*g^3 + (g^3*log(e) + g^3)*B^2*b^3*d^3)*x^3 + (5*b^3*c^3*g^3 - 9*a*b^
2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - (2*g^3*log(e) - g^3)*a^3*d^3)*B^2 - 2*(3*
A*B*a*b^2*d^3*g^3 + (3*a*b^2*d^3*g^3*log(e) + 2*b^3*c*d^2*g^3)*B^2)*x^2 - 2
*(B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B
^2*a^3*d^3*g^3)*log(b*x + a))*log(d*x + c))/(d^6*i^3*x^3 + 3*c*d^5*i^3*x^2
+ 3*c^2*d^4*i^3*x + c^3*d^3*i^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\right.}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x + c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a
^3*g^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g
^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((b*e*x + a*e)/(d*x + c)))/(d^
3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^3 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(dix + ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i
)^3, x)
```

3.101 $\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=410

$$-\frac{2b^2Bg^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^3i^3}+\frac{2b^2B^2g^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\cdots\right.}{d^3i^3}$$

```
[Out] -(B^2*g^2*(a + b*x)^2)/(4*d*i^3*(c + d*x)^2) + (2*A*b*B*g^2*(a + b*x))/(d^2
*i^3*(c + d*x)) - (2*b*B^2*g^2*(a + b*x))/(d^2*i^3*(c + d*x)) + (2*b*B^2*g^
2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(d^2*i^3*(c + d*x)) + (B*g^2*(a +
 b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d*i^3*(c + d*x)^2) - (g^2*
(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d*i^3*(c + d*x)^2) -
 (b*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^3*(c + d*x
)) - (b^2*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c +
d*x)])^2)/(d^3*i^3) - (2*b^2*B*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Pol
yLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3) + (2*b^2*B^2*g^2*PolyLog[3,
 (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rubi [B] time = 5.26595, antiderivative size = 1328, normalized size of antiderivative = 3.24, number of steps used = 102, number of rules used = 25, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.595, Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{b^2B^2g^2\log^3(c+dx)}{3d^3i^3}-\frac{b^2B^2g^2\log(a+bx)\log^2(c+dx)}{d^3i^3}+\frac{b^2B^2g^2\log\left(\frac{e(a+bx)}{c+dx}\right)\log^2(c+dx)}{d^3i^3}+\frac{3b^2B^2g^2\log^2(c+dx)}{2d^3i^3}+\frac{Ab\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^
3,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g^2)/(4*d^3*i^3*(c + d*x)^2) + (5*b*B^2*(b*c - a*d)*g^2
)/(2*d^3*i^3*(c + d*x)) + (5*b^2*B^2*g^2*Log[a + b*x])/(2*d^3*i^3) + (3*b^2
*B^2*g^2*Log[a + b*x]^2)/(2*d^3*i^3) - (b^2*B^2*g^2*Log[a + b*x]*Log[(c + d
*x)^(-1)]^2)/(d^3*i^3) + (b^2*B^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log
[(c + d*x)^(-1)]^2)/(d^3*i^3) + (B*(b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(2*d^3*i^3*(c + d*x)^2) - (3*b*B*(b*c - a*d)*g^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/(d^3*i^3*(c + d*x)) - (3*b^2*B*g^2*Log[a + b*x]
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^3) - ((b*c - a*d)^2*g^2*(A +
B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d^3*i^3*(c + d*x)^2) + (2*b*(b*c - a*
d)*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i^3*(c + d*x)) - (5*b^2
*B^2*g^2*Log[c + d*x])/(2*d^3*i^3) - (b^2*B^2*g^2*Log[a + b*x]^2*Log[c + d*
x])/(d^3*i^3) - (2*A*b^2*B*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
x])/(d^3*i^3) - (3*b^2*B^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
x])/(d^3*i^3) - (2*b^2*B^2*g^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x
])/(d^3*i^3) + (2*b^2*B^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*
x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^3
*i^3) + (3*b^2*B*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^
3*i^3) + (b^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/(d^3
*i^3) + (A*b^2*B*g^2*Log[c + d*x]^2)/(d^3*i^3) + (3*b^2*B^2*g^2*Log[c + d*x
]^2)/(2*d^3*i^3) - (b^2*B^2*g^2*Log[a + b*x]*Log[c + d*x]^2)/(d^3*i^3) + (b
^2*B^2*g^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/(d^3*i^3) + (b^2*B^
2*g^2*Log[c + d*x]^3)/(3*d^3*i^3) - (3*b^2*B^2*g^2*Log[a + b*x]*Log[(b*(c +
```

```
 d*x))/(b*c - a*d)])/(d^3*i^3) + (b^2*B^2*g^2*Log[a + b*x]^2*Log[(b*(c + d*
x))/(b*c - a*d)])/(d^3*i^3) - (3*b^2*B^2*g^2*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(d^3*i^3) + (2*b^2*B^2*g^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*
x))/(b*c - a*d))])/(d^3*i^3) - (2*A*b^2*B*g^2*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/(d^3*i^3) - (3*b^2*B^2*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(d^3*i^3) - (2*b^2*B^2*g^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(d^3*i^3) + (2*b^2*B^2*g^2*(Log[a + b*x] + Log[(c + d*x)^(-1)]
- Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3
*i^3) - (2*b^2*B^2*g^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^3)
- (2*b^2*B^2*g^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
```

```
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(101c+101dx)^3}\,dx = \int\left(\frac{(-bc+ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1030301d^2(c+dx)^3} - \frac{2b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+b}{c+dx}\right.\right.}{1030301d^2(c+dx)^2}\right.$$

$$= \frac{\left(b^2g^2\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{1030301d^2} - \frac{\left(2b(bc-ad)g^2\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2}\,dx}{1030301d^2} + \frac{((}{}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1030301d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1030301d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1030301d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2060602d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1030301d^3(c+dx)}$$

$$= \frac{B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2060602d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1030301d^3(c+dx)}$$

$$= \frac{B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2060602d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1030301d^3(c+dx)}$$

$$= \frac{B(bc-ad)^2g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2060602d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1030301d^3(c+dx)}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{B(bc}{}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{B(bc}{}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{3b^2}{}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{3b^2}{}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{3b^2}{}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{3b^2}{}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{3b^2}{}$$

$$= -\frac{B^2(bc-ad)^2g^2}{4121204d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2}{2060602d^3(c+dx)} + \frac{5b^2B^2g^2\log(a+bx)}{2060602d^3} + \frac{3b^2}{}$$

Mathematica [B] time = 5.61032, size = 2950, normalized size = 7.2

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^3,x]
```

```
[Out] (g^2*((-2*A^2*(b*c - a*d)^2)/(c + d*x)^2 + (8*A^2*b*(b*c - a*d))/(c + d*x)
+ 4*A^2*b^2*Log[c + d*x] - (4*a*A*b*B*d*(-(b^2*c^3) + 4*a*b*c^2*d - 3*a^2*c
*d^2 - 2*b^2*c^2*d*x + 6*a*b*c*d^2*x - 4*a^2*d^3*x - 2*b*(b*c - 2*a*d)*(c +
 d*x)^2*Log[a + b*x] + 2*(b*c - a*d)^2*(c + 2*d*x)*Log[(e*(a + b*x))/(c + d
*x)] + 2*b^2*c^3*Log[c + d*x] - 4*a*b*c^2*d*Log[c + d*x] + 4*b^2*c^2*d*x*Lo
g[c + d*x] - 8*a*b*c*d^2*x*Log[c + d*x] + 2*b^2*c*d^2*x^2*Log[c + d*x] - 4*
a*b*d^3*x^2*Log[c + d*x]))/((b*c - a*d)^2*(c + d*x)^2) - (2*a^2*A*B*d^2*(-(
b^2*c^2) + 4*a*b*c*d - a^2*d^2 + 2*b^2*c*d*x + 2*a*b*d^2*x + 2*b^2*d^2*x^2
- 2*b^2*(c + d*x)^2*Log[a/b + x] + 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c + d
*x)] + 2*b^2*c^2*Log[(b*(c + d*x))/(b*c - a*d)] + 4*b^2*c*d*x*Log[(b*(c + d
*x))/(b*c - a*d)] + 2*b^2*d^2*x^2*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c -
a*d)^2*(c + d*x)^2) + 2*A*b^2*B*(-2*Log[c/d + x]^2 - (8*c*(1 + Log[c/d + x]
))/(c + d*x) + (c^2*(1 + 2*Log[c/d + x]))/(c + d*x)^2 + 8*c*(Log[a/b + x]/(
c + d*x) + (b*(Log[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d)) + 2*(-Log[a/b
+ x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)])*((c*(3*c + 4*d*x))/(c +
 d*x)^2 + 2*Log[c + d*x]) + (2*c^2*(-Log[a/b + x] + (b*(c + d*x)*(b*c - a*d
 + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]))/(b*c - a*d)^2))/(c
 + d*x)^2 + 4*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)])) + (2*a*b*B^2*d*(2*c*Log[(e*(a + b*x))/(c + d*x
)]^2 - 4*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^2 - (4*(c + d*x)*(2*b*c - 2
*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*
x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*
x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d
)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c +
d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] +
 Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
))/(b*c - a*d) + (c*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c +
 d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c + d*x)] - 4*b*(
b*c - a*d)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)] - 4*b^2*(c + d*x)^2*Log[a
 + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*b
*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]
) - 4*b^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b
*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c +
d*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
 + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])))/(b*c - a*d)^2))/(c + d*x)^2 - (a^2*B^2*d^2*((b*c - a*d)^2 + 2*b*(b*c -
 a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(e*(
a + b*x))/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x
)] - 4*b^2*(c + d*x)^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 2*(b*c -
 a*d)^2*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4
*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*
x]) - 4*b^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c +
 b*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c
+ d*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])))/((b*c - a*d)^2*(c + d*x)^2) - 2*b^2*B^2*((c^2*Log[(e*(a + b*x))/(c +
 d*x)]^2)/(c + d*x)^2 - (4*c*Log[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) + 2*
```

```
Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 4*Log[(e*(a
 + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - (4*c*(2*b*c -
 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c +
d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c +
d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a
*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c
+ d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
 + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])))/((b*c - a*d)*(c + d*x)) + (c^2*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d
*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(e*(a + b*x))/(c
 + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)] - 4*b^2*(
c + d*x)^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b^2*(c + d*x)^2*Lo
g[c + d*x] + 4*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d
*x)*Log[c + d*x]) - 4*b^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c
 - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)
]) + 2*b^2*(c + d*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))
/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/(2*(b*c - a*d)^2*(c + d*x)^2) - 4*PolyLog[3, (d*(a + b
*x))/(b*(c + d*x))])))/(4*d^3*i^3)
```

Maple [F] time = 2.149, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{2}}{\left(dix+ci\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -A*B*a*b*g^2*(2*(2*d*x + c)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4*i^3*x
^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*
x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2
- a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*
c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*
a*b*c*d^3 + a^2*d^4)*i^3)) + 1/2*A*B*a^2*g^2*((2*b*d*x + 3*b*c - a*d)/((b*c
*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^
2)*i^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3
*x + c^2*d*i^3) + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i
^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 1/2*A
^2*b^2*g^2*((4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) +
 2*log(d*x + c)/(d^3*i^3)) - (2*d*x + c)*A^2*a*b*g^2/(d^4*i^3*x^2 + 2*c*d^3
```

```
*i^3*x + c^2*d^2*i^3) - 1/2*A^2*a^2*g^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*
d*i^3) + 1/6*(2*(B^2*b^2*d^2*g^2*x^2 + 2*B^2*b^2*c*d*g^2*x + B^2*b^2*c^2*g^
2)*log(d*x + c)^3 + 3*(4*(b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*x + (3*b^2*c^2*g^2
 - 2*a*b*c*d*g^2 - a^2*d^2*g^2)*B^2)*log(d*x + c)^2)/(d^5*i^3*x^2 + 2*c*d^4
*i^3*x + c^2*d^3*i^3) - integrate(-(2*B^2*a*b*d^2*g^2*x*log(e)^2 + B^2*a^2*
d^2*g^2*log(e)^2 + (B^2*b^2*d^2*g^2*log(e)^2 + 2*A*B*b^2*d^2*g^2*log(e))*x^
2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(b*x +
 a)^2 + 2*(2*B^2*a*b*d^2*g^2*x*log(e) + B^2*a^2*d^2*g^2*log(e) + (B^2*b^2*d
^2*g^2*log(e) + A*B*b^2*d^2*g^2)*x^2)*log(b*x + a) - (4*(b^2*c*d*g^2 + (g^2
*log(e) - g^2)*a*b*d^2)*B^2*x + (3*b^2*c^2*g^2 - 2*a*b*c*d*g^2 + (2*g^2*log
(e) - g^2)*a^2*d^2)*B^2 + 2*(B^2*b^2*d^2*g^2*log(e) + A*B*b^2*d^2*g^2)*x^2
+ 2*(B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(b*x +
 a))*log(d*x + c))/(d^5*i^3*x^3 + 3*c*d^4*i^3*x^2 + 3*c^2*d^3*i^3*x + c^3*d
^2*i^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABb^2g^2x^2 + 2\,ABabg^2\right.}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x + c^3i^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^
2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*
b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/
(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{\left(dix + ci\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i
)^3, x)
```

3.102 $\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=141

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)}-\frac{Bg(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}+\frac{B^2g(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

```
[Out] (B^2*g*(a + b*x)^2)/(4*(b*c - a*d)*i^3*(c + d*x)^2) - (B*g*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)*i^3*(c + d*x)^2) + (g*(a +
 b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)*i^3*(c + d*x
)^2)
```

Rubi [C] time = 1.96088, antiderivative size = 634, normalized size of antiderivative = 4.5, number of steps used = 58, number of rules used = 11, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2B^2g\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{d^2i^3(bc-ad)}+\frac{b^2B^2g\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2i^3(bc-ad)}+\frac{b^2Bg\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^3(bc-ad)}-\frac{b^2Bg\log(c+dx)\left(\right.}{d^2i^3(b}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^3,
x]
```

```
[Out] (B^2*(b*c - a*d)*g)/(4*d^2*i^3*(c + d*x)^2) - (b*B^2*g)/(2*d^2*i^3*(c + d*x
)) - (b^2*B^2*g*Log[a + b*x])/(2*d^2*(b*c - a*d)*i^3) - (b^2*B^2*g*Log[a +
b*x]^2)/(2*d^2*(b*c - a*d)*i^3) - (B*(b*c - a*d)*g*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) + (b*B*g*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]))/(d^2*i^3*(c + d*x)) + (b^2*B*g*Log[a + b*x]*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/(d^2*(b*c - a*d)*i^3) + ((b*c - a*d)*g*(A + B*Log[(e*(a +
b*x))/(c + d*x)])^2)/(2*d^2*i^3*(c + d*x)^2) - (b*g*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/(d^2*i^3*(c + d*x)) + (b^2*B^2*g*Log[c + d*x])/(2*d^2*(b*c
 - a*d)*i^3) + (b^2*B^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(
d^2*(b*c - a*d)*i^3) - (b^2*B*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x])/(d^2*(b*c - a*d)*i^3) - (b^2*B^2*g*Log[c + d*x]^2)/(2*d^2*(b*c - a*
d)*i^3) + (b^2*B^2*g*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*(b*c
 - a*d)*i^3) + (b^2*B^2*g*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*(b
*c - a*d)*i^3) + (b^2*B^2*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*(b*
c - a*d)*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(102c+102dx)^3}\,dx=\int \left(\frac{(-bc+ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d(c+dx)^3}+\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d(c+dx)^2}\right)dx$$

$$=\frac{(bg)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2}\,dx}{1061208d}-\frac{((bc-ad)g)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^3}\,dx}{1061208d}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}+\frac{(bBg)\int \frac{(bc-ad)(\ldots}{(a\ldots}}{530\ldots}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}+\frac{(bB(bc-ad)g)\ldots}{53\ldots}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}+\frac{(bB(bc-ad)g)\ldots}{\ldots}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2122416d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1061208d^2(c+dx)}+\frac{(bBg)\int \frac{A+B\log\ldots}{(c+\ldots}}{106120\ldots}$$

$$=-\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2122416d^2(c+dx)^2}+\frac{bBg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1061208d^2(c+dx)}+\frac{b^2Bg\log(a\ldots}{10\ldots}$$

$$=-\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2122416d^2(c+dx)^2}+\frac{bBg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1061208d^2(c+dx)}+\frac{b^2Bg\log(a\ldots}{10\ldots}$$

$$=-\frac{B(bc-ad)g\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2122416d^2(c+dx)^2}+\frac{bBg\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1061208d^2(c+dx)}+\frac{b^2Bg\log(a\ldots}{10\ldots}$$

$$=\frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2}-\frac{bB^2g}{2122416d^2(c+dx)}-\frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad)}-\frac{B(bc-ad)\ldots}{212\ldots}$$

$$=\frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2}-\frac{bB^2g}{2122416d^2(c+dx)}-\frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad)}-\frac{B(bc-ad)\ldots}{212\ldots}$$

$$=\frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2}-\frac{bB^2g}{2122416d^2(c+dx)}-\frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad)}-\frac{b^2B^2g\log^2\ldots}{2122416d^2\ldots}$$

$$=\frac{B^2(bc-ad)g}{4244832d^2(c+dx)^2}-\frac{bB^2g}{2122416d^2(c+dx)}-\frac{b^2B^2g\log(a+bx)}{2122416d^2(bc-ad)}-\frac{b^2B^2g\log^2\ldots}{2122416d^2\ldots}$$

Mathematica [C] time = 0.897672, size = 767, normalized size = 5.44

$$\frac{g\left(-B\left(-2b^2B(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2B(c+dx)^2\left(2\text{PolyLog}\ldots\right.\right.\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i
*x)^3,x]
```

```
[Out] (g*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 4*b*(b*c - a*d
)*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 4*b*B*(c + d*x)*(2*(b*
c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*(c + d*x)*Log[a + b*x]*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b*(c + d*x)*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x] - 2*B*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b
*(c + d*x)*Log[c + d*x]) - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Lo
g[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
 + b*B*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[
c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) - B*(2*(b*c - a*d)^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[
(e*(a + b*x))/(c + d*x)]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)
])*Log[c + d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b
*(c + d*x)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2
*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*b^2*B*(
c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*(c + d*x)^2*((2*Log
[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)]))))/(4*d^2*(b*c - a*d)*i^3*(c + d*x)^2)
```

Maple [B] time = 0.059, size = 2449, normalized size = 17.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] 1/2/d^2*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^3*c+3/4*g
/(a*d-b*c)^2/i^3*B^2/(d*x+c)^2*a^2*b*c-1/2/d^2*g/(a*d-b*c)^2/i^3*B^2*b^3/(d
*x+c)*c^2+1/4/d^2*g/(a*d-b*c)^2/i^3*B^2/(d*x+c)^2*b^3*c^3-2*g/(a*d-b*c)^2/i
^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-3/2*g/(a*d-b*c)^2/i^3*
A*B/(d*x+c)^2*a^2*b*c-1/d^2*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))^2*b^3/(d*x+c)*c^2+1/2/d^2*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2/(d*x+c)^2*b^3*c^3+1/d^2*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/2/d^2*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+3/2*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c-1/2/d^2*g/(a*d-b*c)^2/i^3*A*B/(d*x
+c)^2*b^3*c^3-3/2/d*g/(a*d-b*c)^2/i^3*A^2/(d*x+c)^2*b^2*c^2*a+2/d*g/(a*d-b*
c)^2/i^3*A^2*b^2/(d*x+c)*c*a+1/d*g/(a*d-b*c)^2/i^3*B^2*b^2/(d*x+c)*a*c-3/4/
d*g/(a*d-b*c)^2/i^3*B^2/(d*x+c)^2*b^2*c^2*a+1/d^2*g/(a*d-b*c)^2/i^3*A*B*b^3
/(d*x+c)*c^2-3/2*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x
+c)^2*a^2*b*c-2/d^2*g/(a*d-b*c)^2/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b
^3/(d*x+c)*c^2+2/d*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*
b^2/(d*x+c)*a*c-2/d*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b
^2/(d*x+c)*a*c-3/2/d*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2/(d*x+c)^2*a*b^2*c^2+3/2/d*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*x+c)^2*a*b^2*c^2+3*g/(a*d-b*c)^2/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*x+c)^2*a^2*b*c+1/d^2*g/(a*d-b*c)^2/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*x+c)^2*b^3*c^3-2/d*g/(a*d-b*c)^2/i^3*A*B*b^2/(d*x+c)*c*a+3/2/
d*g/(a*d-b*c)^2/i^3*A*B/(d*x+c)^2*a*b^2*c^2+1/d^2*g/(a*d-b*c)^2/i^3*A*B*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/2*d*g/(a*d-b*c)^2/i^3*A^2/(d*x+c)^2*a^
3-1/4*d*g/(a*d-b*c)^2/i^3*B^2/(d*x+c)^2*a^3-1/2*g/(a*d-b*c)^2/i^3*B^2*b/(d*
x+c)*a^2-g/(a*d-b*c)^2/i^3*A^2*b/(d*x+c)*a^2+1/4/d^2*g/(a*d-b*c)^2/i^3*B^2*
```

```
b^3*c+1/2/d^2*g/(a*d-b*c)^2/i^3*A^2*b^3*c-1/2/d*g/(a*d-b*c)^2/i^3*A^2*b^2*a
-1/4/d*g/(a*d-b*c)^2/i^3*B^2*b^2*a-1/2*d*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^3-g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))^2*b/(d*x+c)*a^2+1/2*d*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))/(d*x+c)^2*a^3+1/2/d*g/(a*d-b*c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*b^2*a+3/2*g/(a*d-b*c)^2/i^3*A^2/(d*x+c)^2*a^2*b*c+g/(a*d-b*c
)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-1/2/d^2*g/(a*d-b*
c)^2/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/2/d*g/(a*d-b*c)^2/i^3*
B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*a-1/2/d^2*g/(a*d-b*c)^2/i^3*A*B*b
^3*c-1/d^2*g/(a*d-b*c)^2/i^3*A^2*b^3/(d*x+c)*c^2+1/2/d^2*g/(a*d-b*c)^2/i^3*
A^2/(d*x+c)^2*b^3*c^3+1/2*d*g/(a*d-b*c)^2/i^3*A*B/(d*x+c)^2*a^3+g/(a*d-b*c)
^2/i^3*A*B*b/(d*x+c)*a^2-3/d*g/(a*d-b*c)^2/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*x+c)^2*a*b^2*c^2+4/d*g/(a*d-b*c)^2/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*b^2/(d*x+c)*a*c-1/d*g/(a*d-b*c)^2/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*b^2*a-d*g/(a*d-b*c)^2/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*
x+c)^2*a^3+1/2/d*g/(a*d-b*c)^2/i^3*A*B*b^2*a
```

Maxima [B] time = 1.9975, size = 2654, normalized size = 18.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] -1/2*(2*d*x + c)*B^2*b*g*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(d^4*i^3*x^
2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) + 1/4*(2*((2*b*d*x + 3*b*c - a*d)/((b*c*d^
3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*
i^3) + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2
*log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3))*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - (7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*
b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^
2)*log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x
+ b^2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b
^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))/(b^2*c^4*d*
i^3 - 2*a*b*c^3*d^2*i^3 + a^2*c^2*d^3*i^3 + (b^2*c^2*d^3*i^3 - 2*a*b*c*d^4*
i^3 + a^2*d^5*i^3)*x^2 + 2*(b^2*c^3*d^2*i^3 - 2*a*b*c^2*d^3*i^3 + a^2*c*d^4
*i^3)*x))*B^2*a*g + 1/4*(2*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c
*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*
d^3)*i^3) + 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 +
a^2*d^4)*i^3) - 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^
3 + a^2*d^4)*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (b^2*c^3 - 8*a*b*
c^2*d + 7*a^2*c*d^2 + 2*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*d^3)*x^
2 + 2*(b^2*c^2*d - 2*a*b*c*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c^3 - 2*a*b*c^2*
d + (b^2*c*d^2 - 2*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 2*a*b*c*d^2)*x)*log(d*x +
c)^2 + 2*(b^2*c^2*d - 5*a*b*c*d^2 + 4*a^2*d^3)*x + 2*(b^2*c^3 - 4*a*b*c^2*d
 + (b^2*c*d^2 - 4*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 4*a*b*c*d^2)*x)*log(b*x + a
) - 2*(b^2*c^3 - 4*a*b*c^2*d + (b^2*c*d^2 - 4*a*b*d^3)*x^2 + 2*(b^2*c^2*d -
 4*a*b*c*d^2)*x + 2*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*d^3)*x^2 +
2*(b^2*c^2*d - 2*a*b*c*d^2)*x)*log(b*x + a))*log(d*x + c))/(b^2*c^4*d^2*i^3
 - 2*a*b*c^3*d^3*i^3 + a^2*c^2*d^4*i^3 + (b^2*c^2*d^4*i^3 - 2*a*b*c*d^5*i^3
 + a^2*d^6*i^3)*x^2 + 2*(b^2*c^3*d^3*i^3 - 2*a*b*c^2*d^4*i^3 + a^2*c*d^5*i^
3)*x))*B^2*b*g - 1/2*A*B*b*g*(2*(2*d*x + c)*log(b*e*x/(d*x + c) + a*e/(d*x
+ c))/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b
*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3
*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*
```

```
c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((
b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3)) + 1/2*A*B*a*g*((2*b*d*x + 3*b*c
- a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*
d - a*c^2*d^2)*i^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 +
 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2
+ a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i
^3)) - 1/2*B^2*a*g*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(d^3*i^3*x^2 + 2*
c*d^2*i^3*x + c^2*d*i^3) - 1/2*(2*d*x + c)*A^2*b*g/(d^4*i^3*x^2 + 2*c*d^3*i
^3*x + c^2*d^2*i^3) - 1/2*A^2*a*g/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
```

Fricas [B] time = 0.495467, size = 602, normalized size = 4.27

$$-\frac{2\left(\left(2A^2-2AB+B^2\right)b^2cd-\left(2A^2-2AB+B^2\right)abd^2\right)gx-2\left(B^2b^2d^2gx^2+2B^2abd^2gx+B^2a^2d^2g\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+\left(\cdots\right.}{4\left(\left(bcd^4-ad^5\right)i^3x^2+\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] -1/4*(2*((2*A^2 - 2*A*B + B^2)*b^2*c*d - (2*A^2 - 2*A*B + B^2)*a*b*d^2)*g*x
 - 2*(B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g)*log((b*e*x + a
*e)/(d*x + c))^2 + ((2*A^2 - 2*A*B + B^2)*b^2*c^2 - (2*A^2 - 2*A*B + B^2)*a
^2*d^2)*g - 2*((2*A*B - B^2)*b^2*d^2*g*x^2 + 2*(2*A*B - B^2)*a*b*d^2*g*x +
(2*A*B - B^2)*a^2*d^2*g)*log((b*e*x + a*e)/(d*x + c)))/((b*c*d^4 - a*d^5)*i
^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)
```

Sympy [B] time = 14.2331, size = 712, normalized size = 5.05

$$\frac{Bb^2g\left(2A-B\right)\log\left(x+\frac{2ABab^2dg+2ABb^3cg-B^2ab^2dg-B^2b^3cg-\frac{Ba^2b^2d^2g(2A-B)}{ad-bc}+\frac{2Bab^3cdg(2A-B)}{ad-bc}-\frac{Bb^4c^2g(2A-B)}{ad-bc}}{4ABb^3dg-2B^2b^3dg}\right)}{2d^2i^3\left(ad-bc\right)}-\frac{Bb^2g\left(2A-B\right)\log\left(x+\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] B*b**2*g*(2*A - B)*log(x + (2*A*B*a*b**2*d*g + 2*A*B*b**3*c*g - B**2*a*b**2
*d*g - B**2*b**3*c*g - B*a**2*b**2*d**2*g*(2*A - B)/(a*d - b*c) + 2*B*a*b**
3*c*d*g*(2*A - B)/(a*d - b*c) - B*b**4*c**2*g*(2*A - B)/(a*d - b*c))/(4*A*B
*b**3*d*g - 2*B**2*b**3*d*g))/(2*d**2*i**3*(a*d - b*c)) - B*b**2*g*(2*A - B
)*log(x + (2*A*B*a*b**2*d*g + 2*A*B*b**3*c*g - B**2*a*b**2*d*g - B**2*b**3*
c*g + B*a**2*b**2*d**2*g*(2*A - B)/(a*d - b*c) - 2*B*a*b**3*c*d*g*(2*A - B)
/(a*d - b*c) + B*b**4*c**2*g*(2*A - B)/(a*d - b*c))/(4*A*B*b**3*d*g - 2*B**
2*b**3*d*g))/(2*d**2*i**3*(a*d - b*c)) + (-B**2*a**2*g - 2*B**2*a*b*g*x - B
**2*b**2*g*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a*c**2*d*i**3 + 4*a*c*d**
2*i**3*x + 2*a*d**3*i**3*x**2 - 2*b*c**3*i**3 - 4*b*c**2*d*i**3*x - 2*b*c*d
**2*i**3*x**2) - (2*A**2*a*d*g + 2*A**2*b*c*g - 2*A*B*a*d*g - 2*A*B*b*c*g +
 B**2*a*d*g + B**2*b*c*g + x*(4*A**2*b*d*g - 4*A*B*b*d*g + 2*B**2*b*d*g))/(
4*c**2*d**2*i**3 + 8*c*d**3*i**3*x + 4*d**4*i**3*x**2) + (-2*A*B*a*d*g - 2*
A*B*b*c*g - 4*A*B*b*d*g*x + B**2*a*d*g + B**2*b*c*g + 2*B**2*b*d*g*x)*log(e
*(a + b*x)/(c + d*x))/(2*c**2*d**2*i**3 + 4*c*d**3*i**3*x + 2*d**4*i**3*x**
```

2)

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i)^
3, x)
```

3.103 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=296

$$\frac{Bd(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{i^3(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)^2}-\frac{2AbB(a}{i^3(c+dx)(}$$

```
[Out] -(B^2*d*(a + b*x)^2)/(4*(b*c - a*d)^2*i^3*(c + d*x)^2) - (2*A*b*B*(a + b*x)
)/((b*c - a*d)^2*i^3*(c + d*x)) + (2*b*B^2*(a + b*x))/((b*c - a*d)^2*i^3*(c
 + d*x)) - (2*b*B^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^2*
i^3*(c + d*x)) + (B*d*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*
(b*c - a*d)^2*i^3*(c + d*x)^2) - (d*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])^2)/(2*(b*c - a*d)^2*i^3*(c + d*x)^2) + (b*(a + b*x)*(A + B*Log[(e
*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*i^3*(c + d*x))
```

Rubi [C] time = 0.913585, antiderivative size = 577, normalized size of antiderivative = 1.95, number of steps used = 30, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{di^3(bc-ad)^2}+\frac{b^2B^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di^3(bc-ad)^2}+\frac{b^2B\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{di^3(bc-ad)^2}-\frac{b^2B\log(c+dx)\left(B\right.}{di^3(bc}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^3,x]
```

```
[Out] -B^2/(4*d*i^3*(c + d*x)^2) - (3*b*B^2)/(2*d*(b*c - a*d)*i^3*(c + d*x)) - (3
*b^2*B^2*Log[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (b^2*B^2*Log[a + b*x]^2)/(
2*d*(b*c - a*d)^2*i^3) + (B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d*i^3*
(c + d*x)^2) + (b*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d*(b*c - a*d)*i^
3*(c + d*x)) + (b^2*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d
*(b*c - a*d)^2*i^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(2*d*i^3*(c +
d*x)^2) + (3*b^2*B^2*Log[c + d*x])/(2*d*(b*c - a*d)^2*i^3) + (b^2*B^2*Log[-
((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d*(b*c - a*d)^2*i^3) - (b^2*B*(
A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d*(b*c - a*d)^2*i^3) - (
b^2*B^2*Log[c + d*x]^2)/(2*d*(b*c - a*d)^2*i^3) + (b^2*B^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(d*(b*c - a*d)^2*i^3) + (b^2*B^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(d*(b*c - a*d)^2*i^3) + (b^2*B^2*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)])/(d*(b*c - a*d)^2*i^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(103c+103dx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}+\frac{B\int\frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{10609(a+bx)(c+dx)^3}\,dx}{103d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}+\frac{(B(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)^3}\,dx}{1092727d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}+\frac{(B(bc-ad))\int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^3(a+bx)}-\frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(c+dx)^3}-\frac{bd\left(A+\cdots\right.}{(bc\cdots}\right.}{1092727d}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2}-\frac{B\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^3}\,dx}{1092727}-\frac{\left(b^2B\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{1092727(bc-ad)^2}+\frac{\left(b^3B\right)\int\cdots}{1092\cdots}$$

$$= \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2}+\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)}+\frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(\cdots}{c\cdots}\right.\right.}{1092727d(bc-ad)^2}$$

$$= \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2}+\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)}+\frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(\cdots}{c\cdots}\right.\right.}{1092727d(bc-ad)^2}$$

$$= \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2}+\frac{bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)}+\frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(\cdots}{c\cdots}\right.\right.}{1092727d(bc-ad)^2}$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}+\frac{B\left(A+B\cdots\right.}{218545\cdots}$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}+\frac{B\left(A+B\cdots\right.}{218545\cdots}$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}-\frac{b^2B^2\log\cdots}{2185454d\cdots}$$

$$= -\frac{B^2}{4370908d(c+dx)^2}-\frac{3bB^2}{2185454d(bc-ad)(c+dx)}-\frac{3b^2B^2\log(a+bx)}{2185454d(bc-ad)^2}-\frac{b^2B^2\log\cdots}{2185454d\cdots}$$

Mathematica [C] time = 0.44917, size = 444, normalized size = 1.5

$$\frac{B\left(-2b^2B(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2B(c+dx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x
)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c +
 d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*b^2*B*(c + d*x)^
```

```
2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyL
og[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*(c + d*x)^2*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

Maple [B] time = 0.055, size = 1917, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] -1/2*d^2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^
3-3/(a*d-b*c)^3/i^3*B^2*b^2/(d*x+c)*c*a-1/2/d/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2*b^3*c+1/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*b^2*a+1/4/d/(a*d-b*c)^3/i^3*B^2/(d*x+c)^2*b^3*c^3+1/2*d^2/(a*d-b*
c)^3/i^3*A*B/(d*x+c)^2*a^3-3/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*x+c)^2*a*b^2*c^2+1/d/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*x+c)^2*b^3*c^3+1/2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2*b^2*a-3/2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a
-1/4*d^2/(a*d-b*c)^3/i^3*B^2/(d*x+c)^2*a^3-1/2*d^2/(a*d-b*c)^3/i^3*A^2/(d*x
+c)^2*a^3+3/2/d/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c+1
/2*d^2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-1/
2/d/(a*d-b*c)^3/i^3*A^2*b^3*c+7/4/(a*d-b*c)^3/i^3*B^2*b^2*a-7/4/d/(a*d-b*c)
^3/i^3*B^2*b^3*c+1/2/(a*d-b*c)^3/i^3*A^2*b^2*a+3/2*d/(a*d-b*c)^3/i^3*B^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c-3/2*d/(a*d-b*c)^3/i^3*B^2
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d/(a*d-b*c)^3/i^3*A*
B/(d*x+c)^2*a^2*b*c+3*d/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*x+c)^2*a^2*b*c+3/2*d/(a*d-b*c)^3/i^3*A^2/(d*x+c)^2*a^2*b*c+2/(a*d-b*c)^
3/i^3*A*B*b^2/(d*x+c)*a*c+3/2/(a*d-b*c)^3/i^3*A*B/(d*x+c)^2*b^2*c^2*a-1/d/(
a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/d/(a*d
-b*c)^3/i^3*A*B*b^3/(d*x+c)*c^2+1/2/d/(a*d-b*c)^3/i^3*A^2/(d*x+c)^2*b^3*c^3
+3/2*d/(a*d-b*c)^3/i^3*B^2*b/(d*x+c)*a^2+3/2/d/(a*d-b*c)^3/i^3*B^2*b^3/(d*x
+c)*c^2-3/2/(a*d-b*c)^3/i^3*A^2/(d*x+c)^2*b^2*c^2*a-3/4/(a*d-b*c)^3/i^3*B^2
/(d*x+c)^2*b^2*c^2*a+2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
b^2/(d*x+c)*a*c-d^2/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*
x+c)^2*a^3-1/d/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-d/
(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-3/2/(a*d-
b*c)^3/i^3*A*B*b^2*a+3/2/d/(a*d-b*c)^3/i^3*A*B*b^3*c+1/2/d/(a*d-b*c)^3/i^3*
B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^3*c^3+3/2/(a*d-b*c)^3/i^3
*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^2*c^2*a-3/2/(a*d-b*c)^3/i^
3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^2*c^2*a-1/2/d/(a*d-b*c)
^3/i^3*A*B/(d*x+c)^2*b^3*c^3-d/(a*d-b*c)^3/i^3*A*B*b/(d*x+c)*a^2+3/4*d/(a*d
-b*c)^3/i^3*B^2/(d*x+c)^2*a^2*b*c-1/2/d/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3
```

Maxima [B] time = 1.55489, size = 1145, normalized size = 3.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algorithm="maxima
")
```

```
[Out] 1/4*(2*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 -
 a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x + a)/((b^2*c^2
*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*c
*d^2 + a^2*d^3)*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (7*b^2*c^2 - 8
*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2
 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d - a*
b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*b^2*
d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)
*log(b*x + a))*log(d*x + c))/(b^2*c^4*d*i^3 - 2*a*b*c^3*d^2*i^3 + a^2*c^2*d
^3*i^3 + (b^2*c^2*d^3*i^3 - 2*a*b*c*d^4*i^3 + a^2*d^5*i^3)*x^2 + 2*(b^2*c^3
*d^2*i^3 - 2*a*b*c^2*d^3*i^3 + a^2*c*d^4*i^3)*x))*B^2 + 1/2*A*B*((2*b*d*x +
 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x +
(b*c^3*d - a*c^2*d^2)*i^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^
3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b
*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2
*d^3)*i^3)) - 1/2*B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(d^3*i^3*x^2 +
 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*
i^3)
```

Fricas [A] time = 0.516859, size = 767, normalized size = 2.59

$$-\frac{\left(2\,A^2-6\,AB+7\,B^2\right)b^2c^2-4\left(A^2-2\,AB+2\,B^2\right)abcd+\left(2\,A^2-2\,AB+B^2\right)a^2d^2-2\left(B^2b^2d^2x^2+2\,B^2b^2cdx+2\,B^2a\right.}{4\left(\left(b^2c^2d^3-2\,a\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algorithm="fricas
")
```

```
[Out] -1/4*((2*A^2 - 6*A*B + 7*B^2)*b^2*c^2 - 4*(A^2 - 2*A*B + 2*B^2)*a*b*c*d + (
2*A^2 - 2*A*B + B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + 2*B^2*b^2*c*d*x + 2*B^2
*a*b*c*d - B^2*a^2*d^2)*log((b*e*x + a*e)/(d*x + c))^2 - 2*((2*A*B - 3*B^2)
*b^2*c*d - (2*A*B - 3*B^2)*a*b*d^2)*x - 2*((2*A*B - 3*B^2)*b^2*d^2*x^2 + 4*
(A*B - B^2)*a*b*c*d - (2*A*B - B^2)*a^2*d^2 - 2*(B^2*a*b*d^2 - 2*(A*B - B^2
)*b^2*c*d)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a
^2*d^5)*i^3*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*i^3*x + (b^2*
c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3)*i^3)
```

Sympy [B] time = 6.61356, size = 892, normalized size = 3.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**3,x)
```

```
[Out] -B*b**2*(2*A - 3*B)*log(x + (2*A*B*a*b**2*d + 2*A*B*b**3*c - 3*B**2*a*b**2*
d - 3*B**2*b**3*c - B*a**3*b**2*d**3*(2*A - 3*B)/(a*d - b*c)**2 + 3*B*a**2*
b**3*c*d**2*(2*A - 3*B)/(a*d - b*c)**2 - 3*B*a*b**4*c**2*d*(2*A - 3*B)/(a*d
 - b*c)**2 + B*b**5*c**3*(2*A - 3*B)/(a*d - b*c)**2)/(4*A*B*b**3*d - 6*B**2
*b**3*d))/(2*d*i**3*(a*d - b*c)**2) + B*b**2*(2*A - 3*B)*log(x + (2*A*B*a*b
**2*d + 2*A*B*b**3*c - 3*B**2*a*b**2*d - 3*B**2*b**3*c + B*a**3*b**2*d**3*(
2*A - 3*B)/(a*d - b*c)**2 - 3*B*a**2*b**3*c*d**2*(2*A - 3*B)/(a*d - b*c)**2
```

```
 + 3*B*a*b**4*c**2*d*(2*A - 3*B)/(a*d - b*c)**2 - B*b**5*c**3*(2*A - 3*B)/(
a*d - b*c)**2)/(4*A*B*b**3*d - 6*B**2*b**3*d))/(2*d*i**3*(a*d - b*c)**2) +
(-B**2*a**2*d + 2*B**2*a*b*c + 2*B**2*b**2*c*x + B**2*b**2*d*x**2)*log(e*(a
 + b*x)/(c + d*x))**2/(2*a**2*c**2*d**2*i**3 + 4*a**2*c*d**3*i**3*x + 2*a**
2*d**4*i**3*x**2 - 4*a*b*c**3*d*i**3 - 8*a*b*c**2*d**2*i**3*x - 4*a*b*c*d**
3*i**3*x**2 + 2*b**2*c**4*i**3 + 4*b**2*c**3*d*i**3*x + 2*b**2*c**2*d**2*i*
*3*x**2) + (-2*A*B*a*d + 2*A*B*b*c + B**2*a*d - 3*B**2*b*c - 2*B**2*b*d*x)*
log(e*(a + b*x)/(c + d*x))/(2*a*c**2*d**2*i**3 + 4*a*c*d**3*i**3*x + 2*a*d*
*4*i**3*x**2 - 2*b*c**3*d*i**3 - 4*b*c**2*d**2*i**3*x - 2*b*c*d**3*i**3*x**
2) - (2*A**2*a*d - 2*A**2*b*c - 2*A*B*a*d + 6*A*B*b*c + B**2*a*d - 7*B**2*b
*c + x*(4*A*B*b*d - 6*B**2*b*d))/(4*a*c**2*d**2*i**3 - 4*b*c**3*d*i**3 + x*
*2*(4*a*d**4*i**3 - 4*b*c*d**3*i**3) + x*(8*a*c*d**3*i**3 - 8*b*c**2*d**2*i
**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i)^3, x)
```

3.104 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=375

$$\frac{b^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{3Bgi^3(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{Bd^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+bx)\left(B\right.}{gi^3(c+d}$$

```
[Out] (B^2*d^2*(a + b*x)^2)/(4*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (4*A*b*B*d*(a +
 b*x))/((b*c - a*d)^3*g*i^3*(c + d*x)) - (4*b*B^2*d*(a + b*x))/((b*c - a*d)
^3*g*i^3*(c + d*x)) + (4*b*B^2*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((
b*c - a*d)^3*g*i^3*(c + d*x)) - (B*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (d^2*(a + b*x)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) - (2*
b*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g*i^3*
(c + d*x)) + (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^
3*g*i^3)
```

Rubi [C] time = 7.36519, antiderivative size = 1899, normalized size of antiderivative = 5.06, number of steps used = 117, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*x)^3),
x]
```

```
[Out] B^2/(4*(b*c - a*d)*g*i^3*(c + d*x)^2) + (7*b*B^2)/(2*(b*c - a*d)^2*g*i^3*(c
 + d*x)) + (7*b^2*B^2*Log[a + b*x])/(2*(b*c - a*d)^3*g*i^3) - (A*b^2*B*Log[
a + b*x]^2)/((b*c - a*d)^3*g*i^3) + (3*b^2*B^2*Log[a + b*x]^2)/(2*(b*c - a*
d)^3*g*i^3) + (b^2*B^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^3*g
*i^3) - (b^2*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(
(b*c - a*d)^3*g*i^3) - (b^2*B^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a
 + b*x))/(c + d*x)]^2)/((b*c - a*d)^3*g*i^3) - (b^2*B^2*Log[a + b*x]*Log[(e
*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^3*g*i^3) - (B*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) - (3*b*B*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/((b*c - a*d)^2*g*i^3*(c + d*x)) - (3*b^2*B*Log[a + b*
x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g*i^3) + (A + B*Log
[(e*(a + b*x))/(c + d*x)])^2/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) + (b*(A + B*
Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*g*i^3*(c + d*x)) + (b^2*Log
[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g*i^3) - (
7*b^2*B^2*Log[c + d*x])/(2*(b*c - a*d)^3*g*i^3) + (b^2*B^2*Log[a + b*x]^2*L
og[c + d*x])/((b*c - a*d)^3*g*i^3) + (2*A*b^2*B*Log[-((d*(a + b*x))/(b*c -
a*d))]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*Log[-((d*(a + b*x))
/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*Log[a + b*x
]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*Log[
-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*
(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^3*g*i^3) + (3*b^2*B*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^3*g*i^3)
- (A*b^2*B*Log[c + d*x]^2)/((b*c - a*d)^3*g*i^3) + (3*b^2*B^2*Log[c + d*x]^
```

```
2)/(2*(b*c - a*d)^3*g*i^3) + (b^2*B^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c -
a*d)^3*g*i^3) - (b^2*B^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c
 - a*d)^3*g*i^3) - (b^2*B^2*Log[c + d*x]^3)/(3*(b*c - a*d)^3*g*i^3) + (2*A*
b^2*B*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) -
(3*b^2*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^
3) - (b^2*B^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3
*g*i^3) + (2*A*b^2*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)
^3*g*i^3) - (3*b^2*B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*
d)^3*g*i^3) - (2*b^2*B^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/((b*c - a*d)^3*g*i^3) + (2*A*b^2*B*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*(Log[a + b*x] + Lo
g[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*Log[(e*(a + b*x))/(c + d*x
)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3) + (2*b^
2*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (2*
b^2*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b
^2*B^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
```

```
EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
```

```
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
```

```
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(104c+104dx)^3(ag+bgx)}\,dx = \int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^3g(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)g(c+dx)^3} - \frac{bd\left(A+B\log\cdots\right.}{1124864(bc-a\cdots}\right.$$

$$= \frac{b^3\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{1124864(bc-ad)^3g} - \frac{\left(b^2d\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{1124864(bc-ad)^3g} - \frac{(bd)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2}\,d\cdots}{1124864(bc-ad)^2g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{1124864(b\cdots}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{1124864(b\cdots}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{1124864(b\cdots}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{1124864(b\cdots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc-ad)g(c+dx)^2} - \frac{3bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc-ad)^2g(c+dx)} - \frac{3b^2B\log(a+bx)\left(\cdots\right.}{1124864\cdots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc-ad)g(c+dx)^2} - \frac{3bB\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc-ad)^2g(c+dx)} - \frac{3b^2B\log(a+bx)\left(\cdots\right.}{1124864\cdots}$$

$$= -\frac{b^2B^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{1124864(bc-ad)^3g} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc-ad)g(c+dx)^2} - \frac{3bB\left(A+B\log\cdots\right.}{1124864(bc-a\cdots}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\log(a+bx)\cdots}{2249728(bc-ad)^3g\cdots}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\log(a+bx)\cdots}{2249728(bc-ad)^3g\cdots}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\log(a+bx)\cdots}{2249728(bc-ad)^3g\cdots}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\log(a+bx)\cdots}{2249728(bc-ad)^3g\cdots}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\log(a+bx)\cdots}{2249728(bc-ad)^3g\cdots}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\log(a+bx)\cdots}{2249728(bc-ad)^3g\cdots}$$

$$= \frac{B^2}{4499456(bc-ad)g(c+dx)^2} + \frac{7bB^2}{2249728(bc-ad)^2g(c+dx)} + \frac{7b^2B^2\log(a+bx)\cdots}{2249728(bc-ad)^3g\cdots}$$

Mathematica [A] time = 1.08428, size = 290, normalized size = 0.77

$$\frac{6b^2\left(2A^2-6AB+7B^2\right)\log(a+bx)+\frac{6b\left(2A^2-6AB+7B^2\right)(bc-ad)}{c+dx}+\frac{3\left(2A^2-2AB+B^2\right)(bc-ad)^2}{(c+dx)^2}+\frac{6B\left(Bd(a+bx)(ad-4bc-3bdx)+2Ab^2(c+dx)^2\right)\log}{(c+dx)^2}}{12gi^3(bc}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)*(c*i + d*i*
x)^3),x]
```

```
[Out] ((3*(2*A^2 - 2*A*B + B^2)*(b*c - a*d)^2)/(c + d*x)^2 + (6*b*(2*A^2 - 6*A*B
+ 7*B^2)*(b*c - a*d))/(c + d*x) + 6*b^2*(2*A^2 - 6*A*B + 7*B^2)*Log[a + b*x
] + (6*B*(b*c - a*d)*(B*(-7*b*c + a*d - 6*b*d*x) + A*(6*b*c - 2*a*d + 4*b*d
*x))*Log[(e*(a + b*x))/(c + d*x)])/(c + d*x)^2 + (6*B*(2*A*b^2*(c + d*x)^2
+ B*d*(a + b*x)*(-4*b*c + a*d - 3*b*d*x))*Log[(e*(a + b*x))/(c + d*x)]^2)/(
c + d*x)^2 + 4*b^2*B^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*b^2*(2*A^2 - 6*A*
B + 7*B^2)*Log[c + d*x])/(12*(b*c - a*d)^3*g*i^3)
```

Maple [B] time = 0.056, size = 2842, normalized size = 7.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] -2*d/i^3/(a*d-b*c)^4/g*A^2*b^2/(d*x+c)*a*c+1/4/i^3/(a*d-b*c)^4/g*B^2/(d*x+c
)^2*b^3*c^3-7/2*d/i^3/(a*d-b*c)^4/g*A*B*b^2*a+3/4*d^2/i^3/(a*d-b*c)^4/g*B^2
/(d*x+c)^2*a^2*b*c-3/4*d/i^3/(a*d-b*c)^4/g*B^2/(d*x+c)^2*a*b^2*c^2+1/i^3/(a
*d-b*c)^4/g*A^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/2*d^3/i^3/(a*d-b*c)
^4/g*A^2/(d*x+c)^2*a^3-1/4*d^3/i^3/(a*d-b*c)^4/g*B^2/(d*x+c)^2*a^3+7/2/i^3/
(a*d-b*c)^4/g*B^2*b^3/(d*x+c)*c^2+1/i^3/(a*d-b*c)^4/g*A^2*b^3/(d*x+c)*c^2+1
/2/i^3/(a*d-b*c)^4/g*A^2/(d*x+c)^2*b^3*c^3+1/3/i^3/(a*d-b*c)^4/g*B^2*b^3*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*c-3/2/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2*b^3*c+7/2/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*b^3*c-1/3*d/i^3/(a*d-b*c)^4/g*B^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))^3*a+1/i^3/(a*d-b*c)^4/g*A*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+7/2*
d^2/i^3/(a*d-b*c)^4/g*B^2*b/(d*x+c)*a^2+d^2/i^3/(a*d-b*c)^4/g*A^2*b/(d*x+c)
*a^2+1/2*d^3/i^3/(a*d-b*c)^4/g*A*B/(d*x+c)^2*a^3-3/2*d/i^3/(a*d-b*c)^4/g*A^
2/(d*x+c)^2*b^2*c^2*a+3/2*d^2/i^3/(a*d-b*c)^4/g*A^2/(d*x+c)^2*a^2*b*c-3*d^2
/i^3/(a*d-b*c)^4/g*A*B*b/(d*x+c)*a^2+3*d/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*b^2*a-d^3/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))/(d*x+c)^2*a^3+2/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*b^3/(d*x+c)*c^2+1/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*x+c)^2*b^3*c^3-3*d^2/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*b/(d*x+c)*a^2-d/i^3/(a*d-b*c)^4/g*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))^2*a+d^2/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b/(d*x+c
)*a^2-7*d/i^3/(a*d-b*c)^4/g*B^2*b^2/(d*x+c)*a*c-1/2*d^3/i^3/(a*d-b*c)^4/g*B
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^3+1/2*d^3/i^3/(a*d-b*c)^4/
g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-3/i^3/(a*d-b*c)^4/g*A*B
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-3/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/2/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+3/2*d/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2*b^2*a-7/2*d/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*b^2*a-d/i^3/(a*d-b*c)^4/g*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
```

```
x+c))*a-3/i^3/(a*d-b*c)^4/g*A*B*b^3/(d*x+c)*c^2-1/2/i^3/(a*d-b*c)^4/g*A*B/(
d*x+c)^2*b^3*c^3+1/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*
b^3/(d*x+c)*c^2+1/2/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2
/(d*x+c)^2*b^3*c^3+3/2*d/i^3/(a*d-b*c)^4/g*A^2*b^2*a+15/4*d/i^3/(a*d-b*c)^4
/g*B^2*b^2*a-15/4/i^3/(a*d-b*c)^4/g*B^2*b^3*c+7/2/i^3/(a*d-b*c)^4/g*A*B*b^3
*c+3*d^2/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^
2*b*c-3*d/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a
*b^2*c^2-4*d/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x
+c)*c*a-3/2/i^3/(a*d-b*c)^4/g*A^2*b^3*c-3/2*d/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^2*c^2*a-3/2*d^2/i^3/(a*d-b*c)^4/g*A*
B/(d*x+c)^2*a^2*b*c+6*d/i^3/(a*d-b*c)^4/g*A*B*b^2/(d*x+c)*a*c+3/2*d/i^3/(a*
d-b*c)^4/g*A*B/(d*x+c)^2*a*b^2*c^2-3/2*d^2/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+2*d^2/i^3/(a*d-b*c)^4/g*A*B*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-2*d/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))^2*b^2/(d*x+c)*c*a+6*d/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c+3/2*d/i^3/(a*d-b*c)^4/g*B^2*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^2*c^2*a+3/2*d^2/i^3/(a*d-b*c)^4/g*B^2*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c
```

Maxima [B] time = 2.14816, size = 2857, normalized size = 7.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algor
ithm="maxima")
```

```
[Out] 1/2*B^2*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i
^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a
*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x
+ c))^2 + A*B*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^
4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4
 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 -
 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(b*e*x/(d*x + c) + a*e
/(d*x + c)) - 1/12*B^2*(6*(7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2
 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b
^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c
*d*x + b^2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 +
 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))*log(b*
e*x/(d*x + c) + a*e/(d*x + c))/(b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*a^2
*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*d^3
*g*i^3 + 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 - 3*
a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x) - (45*b^2
*c^2 - 48*a*b*c*d + 3*a^2*d^2 + 4*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log
(b*x + a)^3 - 4*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^3 + 18*(
b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 6*(3*b^2*d^2*x^2 + 6*
b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a
))*log(d*x + c)^2 + 42*(b^2*c*d - a*b*d^2)*x + 42*(b^2*d^2*x^2 + 2*b^2*c*d*
x + b^2*c^2)*log(b*x + a) - 6*(7*b^2*d^2*x^2 + 14*b^2*c*d*x + 7*b^2*c^2 + 2
*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 6*(b^2*d^2*x^2 + 2*
b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))/(b^3*c^5*g*i^3 - 3*a*b^2*c
^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3
 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x^2 + 2*(b^
```

```
3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g
*i^3)*x)) + 1/2*A^2*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 +
a^2*d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b
^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 -
 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3
*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3)) - 1/2*(7*b^2*c^2 -
8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^
2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d - a
*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*b^2
*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2
)*log(b*x + a))*log(d*x + c))*A*B/(b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*
a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*
d^3*g*i^3 + 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 -
 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x)
```

Fricas [A] time = 0.556012, size = 1129, normalized size = 3.01

$$\frac{3\left(6A^2 - 14AB + 15B^2\right)b^2c^2 - 24\left(A^2 - 2AB + 2B^2\right)abcd + 3\left(2A^2 - 2AB + B^2\right)a^2d^2 + 4\left(B^2b^2d^2x^2 + 2B^2b^2cdx + B^2b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algor
ithm="fricas")
```

```
[Out] 1/12*(3*(6*A^2 - 14*A*B + 15*B^2)*b^2*c^2 - 24*(A^2 - 2*A*B + 2*B^2)*a*b*c*
d + 3*(2*A^2 - 2*A*B + B^2)*a^2*d^2 + 4*(B^2*b^2*d^2*x^2 + 2*B^2*b^2*c*d*x
+ B^2*b^2*c^2)*log((b*e*x + a*e)/(d*x + c))^3 + 6*((2*A*B - 3*B^2)*b^2*d^2*
x^2 + 2*A*B*b^2*c^2 - 4*B^2*a*b*c*d + B^2*a^2*d^2 - 2*(B^2*a*b*d^2 - 2*(A*B
 - B^2)*b^2*c*d)*x)*log((b*e*x + a*e)/(d*x + c))^2 + 6*((2*A^2 - 6*A*B + 7*
B^2)*b^2*c*d - (2*A^2 - 6*A*B + 7*B^2)*a*b*d^2)*x + 6*((2*A^2 - 6*A*B + 7*B
^2)*b^2*d^2*x^2 + 2*A^2*b^2*c^2 - 8*(A*B - B^2)*a*b*c*d + (2*A*B - B^2)*a^2
*d^2 + 2*(2*(A^2 - 2*A*B + 2*B^2)*b^2*c*d - (2*A*B - 3*B^2)*a*b*d^2)*x)*log
((b*e*x + a*e)/(d*x + c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^4
- a^3*d^5)*g*i^3*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^3 - a
^3*c*d^4)*g*i^3*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c^2*d^
3)*g*i^3)
```

Sympy [B] time = 12.9008, size = 1488, normalized size = 3.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] -B**2*b**2*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g*i**3 - 9*a**2*b*c*d
**2*g*i**3 + 9*a*b**2*c**2*d*g*i**3 - 3*b**3*c**3*g*i**3) + b**2*(2*A**2 -
6*A*B + 7*B**2)*log(x + (2*A**2*a*b**2*d + 2*A**2*b**3*c - 6*A*B*a*b**2*d -
 6*A*B*b**3*c + 7*B**2*a*b**2*d + 7*B**2*b**3*c - a**4*b**2*d**4*(2*A**2 -
6*A*B + 7*B**2)/(a*d - b*c)**3 + 4*a**3*b**3*c*d**3*(2*A**2 - 6*A*B + 7*B**
2)/(a*d - b*c)**3 - 6*a**2*b**4*c**2*d**2*(2*A**2 - 6*A*B + 7*B**2)/(a*d -
b*c)**3 + 4*a*b**5*c**3*d*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 - b**6*c
```

```
**4*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b**3*d - 12*A*B*b**3*
d + 14*B**2*b**3*d))/(2*g*i**3*(a*d - b*c)**3) - b**2*(2*A**2 - 6*A*B + 7*B
**2)*log(x + (2*A**2*a*b**2*d + 2*A**2*b**3*c - 6*A*B*a*b**2*d - 6*A*B*b**3
*c + 7*B**2*a*b**2*d + 7*B**2*b**3*c + a**4*b**2*d**4*(2*A**2 - 6*A*B + 7*B
**2)/(a*d - b*c)**3 - 4*a**3*b**3*c*d**3*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b
*c)**3 + 6*a**2*b**4*c**2*d**2*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 - 4
*a*b**5*c**3*d*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 + b**6*c**4*(2*A**2
 - 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b**3*d - 12*A*B*b**3*d + 14*B**2
*b**3*d))/(2*g*i**3*(a*d - b*c)**3) + (-2*A*B*a*d + 6*A*B*b*c + 4*A*B*b*d*x
 + B**2*a*d - 7*B**2*b*c - 6*B**2*b*d*x)*log(e*(a + b*x)/(c + d*x))/(2*a**2
*c**2*d**2*g*i**3 + 4*a**2*c*d**3*g*i**3*x + 2*a**2*d**4*g*i**3*x**2 - 4*a*
b*c**3*d*g*i**3 - 8*a*b*c**2*d**2*g*i**3*x - 4*a*b*c*d**3*g*i**3*x**2 + 2*b
**2*c**4*g*i**3 + 4*b**2*c**3*d*g*i**3*x + 2*b**2*c**2*d**2*g*i**3*x**2) +
(-2*A*B*b**2*c**2 - 4*A*B*b**2*c*d*x - 2*A*B*b**2*d**2*x**2 - B**2*a**2*d**
2 + 4*B**2*a*b*c*d + 2*B**2*a*b*d**2*x + 4*B**2*b**2*c*d*x + 3*B**2*b**2*d*
*2*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*c**2*d**3*g*i**3 + 4*a**3*c*
d**4*g*i**3*x + 2*a**3*d**5*g*i**3*x**2 - 6*a**2*b*c**3*d**2*g*i**3 - 12*a*
*2*b*c**2*d**3*g*i**3*x - 6*a**2*b*c*d**4*g*i**3*x**2 + 6*a*b**2*c**4*d*g*i
**3 + 12*a*b**2*c**3*d**2*g*i**3*x + 6*a*b**2*c**2*d**3*g*i**3*x**2 - 2*b**
3*c**5*g*i**3 - 4*b**3*c**4*d*g*i**3*x - 2*b**3*c**3*d**2*g*i**3*x**2) + (-
2*A**2*a*d + 6*A**2*b*c + 2*A*B*a*d - 14*A*B*b*c - B**2*a*d + 15*B**2*b*c +
 x*(4*A**2*b*d - 12*A*B*b*d + 14*B**2*b*d))/(4*a**2*c**2*d**2*g*i**3 - 8*a*
b*c**3*d*g*i**3 + 4*b**2*c**4*g*i**3 + x**2*(4*a**2*d**4*g*i**3 - 8*a*b*c*d
**3*g*i**3 + 4*b**2*c**2*d**2*g*i**3) + x*(8*a**2*c*d**3*g*i**3 - 16*a*b*c*
*2*d**2*g*i**3 + 8*b**2*c**3*d*g*i**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)*(d*i*x + c*i)
^3), x)
```

3.105 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=525

$$-\frac{b^3(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2i^3(a+bx)(bc-ad)^4}-\frac{2b^3B(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{b^2d\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{Bg^2i^3(bc-ad)^4}+\frac{3bd^2(a+bx)\left(B\,\mathrm{l}\right.}{g^2i^3(c+d}$$

```
[Out] -(B^2*d^3*(a + b*x)^2)/(4*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (6*A*b*B*d^2
*(a + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) + (6*b*B^2*d^2*(a + b*x))/((b
*c - a*d)^4*g^2*i^3*(c + d*x)) - (2*b^3*B^2*(c + d*x))/((b*c - a*d)^4*g^2*i
^3*(a + b*x)) - (6*b*B^2*d^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c
- a*d)^4*g^2*i^3*(c + d*x)) + (B*d^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (2*b^3*B*(c + d*x)*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(a + b*x)) - (d^3*
(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^4*g^2*i^
3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*(c + d*x)*(A + B*Log[(e*(a + b*x)
)/(c + d*x)])^2)/((b*c - a*d)^4*g^2*i^3*(a + b*x)) - (b^2*d*(A + B*Log[(e*(
a + b*x))/(c + d*x)])^3)/(B*(b*c - a*d)^4*g^2*i^3)
```

Rubi [C] time = 8.41743, antiderivative size = 2071, normalized size of antiderivative = 3.94, number of steps used = 143, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*i*x)^3
),x]
```

```
[Out] (-2*b^2*B^2)/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (B^2*d)/(4*(b*c - a*d)^2*g
^2*i^3*(c + d*x)^2) - (11*b*B^2*d)/(2*(b*c - a*d)^3*g^2*i^3*(c + d*x)) - (1
5*b^2*B^2*d*Log[a + b*x])/(2*(b*c - a*d)^4*g^2*i^3) + (3*A*b^2*B*d*Log[a +
b*x]^2)/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[a + b*x]^2)/(2*(b*c - a*
d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*
d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x
)^(-1)]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[-((b*c - a*d)/(d*(a +
 b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B
^2*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^2*i^3) -
 (2*b^2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^3*(a +
 b*x)) + (B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^2*i^
3*(c + d*x)^2) + (5*b*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d
)^3*g^2*i^3*(c + d*x)) + (3*b^2*B*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/((b*c - a*d)^4*g^2*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^2)/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (d*(A + B*Log[(e*(a + b*x))/(c
+ d*x)])^2)/(2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2) - (2*b*d*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^2*i^3*(c + d*x)) - (3*b^2*d*Log[a
+ b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^2*i^3) + (1
5*b^2*B^2*d*Log[c + d*x])/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[a +
b*x]^2*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*Log[-((d*(a + b
*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log
```

```
[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (6*b
^2*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b*c - a*d)^4*g^2*
i^3) + (6*b^2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(
c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^4
*g^2*i^3) - (3*b^2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(
(b*c - a*d)^4*g^2*i^3) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Lo
g[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*A*b^2*B*d*Log[c + d*x]^2)/((b*c -
a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^2*i^3) -
(3*b^2*B^2*d*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*
B^2*d*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3)
+ (b^2*B^2*d*Log[c + d*x]^3)/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*Log[a +
 b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*
d*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) + (3
*b^2*B^2*d*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^
2*i^3) - (6*A*b^2*B*d*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d
)^4*g^2*i^3) + (3*b^2*B^2*d*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c
 - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(
b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*Log[(c + d*x)^(-
1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) + (6*b^2
*B^2*d*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2
*d*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/
((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*PolyLog[3, -((d*(a + b*x))/(b*c - a*
d))])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*PolyLog[3, (b*(c + d*x))/(b*c
- a*d)])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*PolyLog[3, 1 + (b*c - a*d)/
(d*(a + b*x))])/((b*c - a*d)^4*g^2*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
```

```
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
```

```
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
```

```
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(105c+105dx)^3(ag+bgx)^2}\,dx = \int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)^2} - \frac{b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{385875(bc-ad)^4g^2(a+bx)} + \frac{d^2\left(A+B\log \cdots\right.}{1157625(bc-a \cdots}\right.$$

$$= -\frac{\left(b^3d\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{385875(bc-ad)^4g^2} + \frac{\left(b^2d^2\right)\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{385875(bc-ad)^4g^2} + \frac{b^3\int\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} \cdots}{1157625(bc-ad)^3 \cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log \cdots\right.}{1157625(bc-ad) \cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log \cdots\right.}{1157625(bc-ad) \cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log \cdots\right.}{1157625(bc-ad) \cdots}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log \cdots\right.}{1157625(bc-ad) \cdots}$$

$$= -\frac{2b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc-ad)^3g^2(a+bx)} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2315250(bc-ad)^2g^2(c+dx)^2} + \frac{bBd\left(A+B\log \cdots\right.}{231525(bc-ad)^3 \cdots}$$

$$= -\frac{2b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc-ad)^3g^2(a+bx)} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2315250(bc-ad)^2g^2(c+dx)^2} + \frac{bBd\left(A+B\log \cdots\right.}{231525(bc-ad)^3 \cdots}$$

$$= \frac{b^2B^2d\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{385875(bc-ad)^4g^2} - \frac{2b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc-ad)^3g^2(a+bx)} + \frac{Bd\left(A+B\log \cdots\right.}{2315250(bc-ad \cdots}$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2 \cdots}{2315250(bc-ad) \cdots}$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2 \cdots}{2315250(bc-ad) \cdots}$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2 \cdots}{2315250(bc-ad) \cdots}$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2 \cdots}{2315250(bc-ad) \cdots}$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2 \cdots}{2315250(bc-ad) \cdots}$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2 \cdots}{2315250(bc-ad) \cdots}$$

$$= -\frac{2b^2B^2}{1157625(bc-ad)^3g^2(a+bx)} - \frac{B^2d}{4630500(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2 \cdots}{2315250(bc-ad) \cdots}$$

Mathematica [A] time = 1.50747, size = 453, normalized size = 0.86

$$-\frac{2B\left(-3a^2bBd^2(2c+dx)+a^3Bd^3+3ab^2d\left(2A(c+dx)^2-Bdx(4c+3dx)\right)+b^3\left(6Adx(c+dx)^2+B\left(6c^2dx+2c^3-3d\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^2*(c*i + d*
i*x)^3),x]
```

```
[Out] -((2*A^2 - 2*A*B + B^2)*d*(b*c - a*d)^2*(a + b*x) + 2*b*(4*A^2 - 10*A*B + 1
1*B^2)*d*(b*c - a*d)*(a + b*x)*(c + d*x) + 4*b^2*(A^2 + 2*A*B + 2*B^2)*(b*c
 - a*d)*(c + d*x)^2 + 6*b^2*(2*A^2 - 2*A*B + 5*B^2)*d*(a + b*x)*(c + d*x)^2
*Log[a + b*x] + 2*B*(b*c - a*d)*((2*A - B)*d*(b*c - a*d)*(a + b*x) + 2*b*(4
*A - 5*B)*d*(a + b*x)*(c + d*x) + 4*b^2*(A + B)*(c + d*x)^2)*Log[(e*(a + b*
x))/(c + d*x)] + 2*B*(a^3*B*d^3 - 3*a^2*b*B*d^2*(2*c + d*x) + 3*a*b^2*d*(2*
A*(c + d*x)^2 - B*d*x*(4*c + 3*d*x)) + b^3*(6*A*d*x*(c + d*x)^2 + B*(2*c^3
+ 6*c^2*d*x - 3*d^3*x^3)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 4*b^2*B^2*d*(a
+ b*x)*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 6*b^2*(2*A^2 - 2*A*B +
5*B^2)*d*(a + b*x)*(c + d*x)^2*Log[c + d*x])/(4*(b*c - a*d)^4*g^2*i^3*(a +
b*x)*(c + d*x)^2)
```

Maple [B] time = 0.06, size = 3802, normalized size = 7.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] 11/2*d^3/i^3/(a*d-b*c)^5/g^2*B^2*b/(d*x+c)*a^2-23/4*d/i^3/(a*d-b*c)^5/g^2*B
^2*b^3*c-1/2*d^4/i^3/(a*d-b*c)^5/g^2*A^2/(d*x+c)^2*a^3-e*d/i^3/(a*d-b*c)^5/
g^2*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*d^3/i^3/(a*d-b*c)^5/g^2
*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b/(d*x+c)*a^2-11/2*d^2/i^3/(a*d-b*c)
^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a+2*e/i^3/(a*d-b*c)^5/g^2*B^
2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+e/i^3/(a*d-b*c)^5/g^2*A^2*b^4/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-5/2*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))^2*b^3*c-d^2/i^3/(a*d-b*c)^5/g^2*B^2*b^2*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^3*a+1/2*d^4/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))/(d*x+c)^2*a^3-1/2*d^4/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^3+d/i^3/(a*d-b*c)^5/g^2*B^2*b^3*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))^3*c+1/4*d/i^3/(a*d-b*c)^5/g^2*B^2/(d*x+c)^2*b^3*c^3+2*d
^3/i^3/(a*d-b*c)^5/g^2*A^2*b/(d*x+c)*a^2+2*d/i^3/(a*d-b*c)^5/g^2*A^2*b^3/(d
*x+c)*c^2+1/2*d/i^3/(a*d-b*c)^5/g^2*A^2/(d*x+c)^2*b^3*c^3+11/2*d/i^3/(a*d-b
*c)^5/g^2*B^2*b^3/(d*x+c)*c^2+5/2*d^2/i^3/(a*d-b*c)^5/g^2*A^2*b^2*a+5/2*d^2
/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*a+11/2*d/i^3
/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-3*d^2/i^3/(a*d-b
*c)^5/g^2*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*d/i^3/(a*d-b*c)^5/g^2
*A^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2*d^4/i^3/(a*d-b*c)^5/g^2*A*B/
(d*x+c)^2*a^3-5/2*d/i^3/(a*d-b*c)^5/g^2*A^2*b^3*c+23/4*d^2/i^3/(a*d-b*c)^5/
g^2*B^2*b^2*a-11/2*d^2/i^3/(a*d-b*c)^5/g^2*A*B*b^2*a+11/2*d/i^3/(a*d-b*c)^5
/g^2*A*B*b^3*c-2*e*d/i^3/(a*d-b*c)^5/g^2*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)*a-1/4*d^4/i^3/(a*d-b*c)^5/g^2*B^2/(d*x+c)^2*a^3+3*d^3/i^3/(a*d-b*
c)^5/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3*d^2/i^3/(a
*d-b*c)^5/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-8*d^2
/i^3/(a*d-b*c)^5/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c-2*
```

```
e*d/i^3/(a*d-b*c)^5/g^2*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*a+10*d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*b^2/(d*x+c)*a*c+3/2*d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^2*c^2*a+3/2*d^3/i^3/(a*d-b*c)^5/g^2*B^2*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c+4*d^3/i^3/(a*d-b*c)^5/g^2*
A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-2*e*d/i^3/(a*d-b*c)^5/g^2
*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*a-e*d/i^3/(a*d-b*c)^5/g^2*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2*b^3/(d*x+c)*c^2-d^4/i^3/(a*d-b*c)^5/g^2*A*B*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-5*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/2*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3-3/2*d^3/i^3/(a*d-b*c)^5/g^2*A*B/(d
*x+c)^2*a^2*b*c+3/2*d^2/i^3/(a*d-b*c)^5/g^2*A*B/(d*x+c)^2*a*b^2*c^2+10*d^2/
i^3/(a*d-b*c)^5/g^2*A*B*b^2/(d*x+c)*a*c-2*e*d/i^3/(a*d-b*c)^5/g^2*A*B*b^3/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-3/2*d^3/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+4*d/i^3/(a*d-b*c)^5/g^2*A*B*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+d/i^3/(a*d-b*c)^5/g^2*A*B*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+2*e/i^3/(a*d-b*c)^5/g^2*A*B*b
^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-4*
d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2/(d*x+c)*a
*c-3/2*d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c
)^2*b^2*c^2*a-3*d^2/i^3/(a*d-b*c)^5/g^2*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))^2*a-3/2*d^2/i^3/(a*d-b*c)^5/g^2*A^2/(d*x+c)^2*b^2*c^2*a+3*d/i^3/(a*d-b
*c)^5/g^2*A*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+2*e/i^3/(a*d-b*c)^5/g
^2*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*c+e/i^3/(a*d-b*c)^5/g^2*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-5*d^3/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/2*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^3*c^3+5*d^2/i^3/(a*d-b*c)^5/g^2*A*B*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-5*d/i^3/(a*d-b*c)^5/g^2*A*B*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*b^3*c-5*d/i^3/(a*d-b*c)^5/g^2*A*B*b^3/(d*x+c)*c^2+2*e/i^
3/(a*d-b*c)^5/g^2*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-11*d^2/i^3/
(a*d-b*c)^5/g^2*B^2*b^2/(d*x+c)*a*c-3/4*d^2/i^3/(a*d-b*c)^5/g^2*B^2/(d*x+c)
^2*b^2*c^2*a+3/2*d^3/i^3/(a*d-b*c)^5/g^2*A^2/(d*x+c)^2*a^2*b*c+3/4*d^3/i^3/
(a*d-b*c)^5/g^2*B^2/(d*x+c)^2*a^2*b*c-4*d^2/i^3/(a*d-b*c)^5/g^2*A^2*b^2/(d*
x+c)*a*c-5*d^3/i^3/(a*d-b*c)^5/g^2*A*B*b/(d*x+c)*a^2-1/2*d/i^3/(a*d-b*c)^5/
g^2*A*B/(d*x+c)^2*b^3*c^3
```

Maxima [B] time = 3.26861, size = 5654, normalized size = 10.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -1/2*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d +
 a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)
*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c
*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 +
5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3
*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4
*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^
2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*
d^3 + a^4*d^4)*g^2*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 - A*B*((6*b
```

^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/(
(b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 +
 (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5
)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^
3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2
 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d +
 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x +
c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)
*g^2*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/4*B^2*(2*(4*b^3*c^3 - 1
5*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 -
6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d +
 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c
*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*(
b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d +
 (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a
) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2
*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2
*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*log(
b*e*x/(d*x + c) + a*e/(d*x + c))/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i
^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*
i^3 + (b^5*c^4*d^2*g^2*i^3 - 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^
2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2
*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*
d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i
^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*
g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x) + (8*b^3*c^3 +
15*a*b^2*c^2*d - 24*a^2*b*c*d^2 + a^3*d^3 + 4*(b^3*d^3*x^3 + a*b^2*c^2*d +
(2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a)
^3 - 4*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^
2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^3 + 30*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6
*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d +
2*a*b^2*c*d^2)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*
d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b
^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*l
og(b*x + a))*log(d*x + c)^2 + 3*(13*b^3*c^2*d - 6*a*b^2*c*d^2 - 7*a^2*b*d^3
)*x + 30*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*
c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a) - 6*(5*b^3*d^3*x^3 + 5*a*b^2*c^2*d +
 5*(2*b^3*c*d^2 + a*b^2*d^3)*x^2 + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*
d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 + 5*(b
^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 +
 a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c)
)/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3
- 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3 - 4*
a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^3
 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3
+ 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^2
*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2*
a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*i
^3 + 2*a^5*c*d^5*g^2*i^3)*x)) - 1/2*A^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b
*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3
 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^
2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b
^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (
a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b
^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c
*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d +
 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3)) - 1/2*(4*b^3*c^3 -
15*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 -
 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d

```
+ 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*
c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*
(b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d
+ (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x +
a) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^
2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^
2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*A*B
/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3 -
 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3 - 4*a
*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^3
+ a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3 +
 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^2*
i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2*a
^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*i^
3 + 2*a^5*c*d^5*g^2*i^3)*x)
```

Fricas [A] time = 0.561856, size = 2061, normalized size = 3.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/4*(4*(A^2 + 2*A*B + 2*B^2)*b^3*c^3 + 3*(2*A^2 - 10*A*B + 5*B^2)*a*b^2*c^
2*d - 12*(A^2 - 2*A*B + 2*B^2)*a^2*b*c*d^2 + (2*A^2 - 2*A*B + B^2)*a^3*d^3
+ 4*(B^2*b^3*d^3*x^3 + B^2*a*b^2*c^2*d + (2*B^2*b^3*c*d^2 + B^2*a*b^2*d^3)*
x^2 + (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2)*x)*log((b*e*x + a*e)/(d*x + c))^3
 + 6*((2*A^2 - 2*A*B + 5*B^2)*b^3*c*d^2 - (2*A^2 - 2*A*B + 5*B^2)*a*b^2*d^3
)*x^2 + 2*(3*(2*A*B - B^2)*b^3*d^3*x^3 + 2*B^2*b^3*c^3 + 6*A*B*a*b^2*c^2*d
- 6*B^2*a^2*b*c*d^2 + B^2*a^3*d^3 + 3*(4*A*B*b^3*c*d^2 + (2*A*B - 3*B^2)*a*
b^2*d^3)*x^2 - 3*(B^2*a^2*b*d^3 - 2*(A*B + B^2)*b^3*c^2*d - 4*(A*B - B^2)*a
*b^2*c*d^2)*x)*log((b*e*x + a*e)/(d*x + c))^2 + 3*((6*A^2 - 2*A*B + 13*B^2)
*b^3*c^2*d - 2*(2*A^2 + 2*A*B + 3*B^2)*a*b^2*c*d^2 - (2*A^2 - 6*A*B + 7*B^2
)*a^2*b*d^3)*x + 2*(3*(2*A^2 - 2*A*B + 5*B^2)*b^3*d^3*x^3 + 6*A^2*a*b^2*c^2
*d + 4*(A*B + B^2)*b^3*c^3 - 12*(A*B - B^2)*a^2*b*c*d^2 + (2*A*B - B^2)*a^3
*d^3 + 3*(4*(A^2 + 2*B^2)*b^3*c*d^2 + (2*A^2 - 6*A*B + 7*B^2)*a*b^2*d^3)*x^
2 + 3*(2*(A^2 + 2*A*B + 2*B^2)*b^3*c^2*d + 4*(A^2 - 2*A*B + 2*B^2)*a*b^2*c*
d^2 - (2*A*B - 3*B^2)*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^5*c^4
*d^2 - 4*a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a^4*b*d^6)*g
^2*i^3*x^3 + (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2
*c^2*d^4 - 2*a^4*b*c*d^5 + a^5*d^6)*g^2*i^3*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d
- 2*a^2*b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^
2*i^3*x + (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^
3 + a^5*c^2*d^4)*g^2*i^3)
```

Sympy [B] time = 72.3652, size = 2683, normalized size = 5.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**3,x)
```

```
[Out] -B**2*b**2*d*log(e*(a + b*x)/(c + d*x))**3/(a**4*d**4*g**2*i**3 - 4*a**3*b*
c*d**3*g**2*i**3 + 6*a**2*b**2*c**2*d**2*g**2*i**3 - 4*a*b**3*c**3*d*g**2*i
**3 + b**4*c**4*g**2*i**3) + 3*b**2*d*(2*A**2 - 2*A*B + 5*B**2)*log(x + (6*
A**2*a*b**2*d**2 + 6*A**2*b**3*c*d - 6*A*B*a*b**2*d**2 - 6*A*B*b**3*c*d + 1
5*B**2*a*b**2*d**2 + 15*B**2*b**3*c*d - 3*a**5*b**2*d**6*(2*A**2 - 2*A*B +
5*B**2)/(a*d - b*c)**4 + 15*a**4*b**3*c*d**5*(2*A**2 - 2*A*B + 5*B**2)/(a*d
 - b*c)**4 - 30*a**3*b**4*c**2*d**4*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**
4 + 30*a**2*b**5*c**3*d**3*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 - 15*a*
b**6*c**4*d**2*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 + 3*b**7*c**5*d*(2*
A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4)/(12*A**2*b**3*d**2 - 12*A*B*b**3*d**
2 + 30*B**2*b**3*d**2))/(2*g**2*i**3*(a*d - b*c)**4) - 3*b**2*d*(2*A**2 - 2
*A*B + 5*B**2)*log(x + (6*A**2*a*b**2*d**2 + 6*A**2*b**3*c*d - 6*A*B*a*b**2
*d**2 - 6*A*B*b**3*c*d + 15*B**2*a*b**2*d**2 + 15*B**2*b**3*c*d + 3*a**5*b*
*2*d**6*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 - 15*a**4*b**3*c*d**5*(2*A
**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 + 30*a**3*b**4*c**2*d**4*(2*A**2 - 2*A
*B + 5*B**2)/(a*d - b*c)**4 - 30*a**2*b**5*c**3*d**3*(2*A**2 - 2*A*B + 5*B*
*2)/(a*d - b*c)**4 + 15*a*b**6*c**4*d**2*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b
*c)**4 - 3*b**7*c**5*d*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4)/(12*A**2*b
**3*d**2 - 12*A*B*b**3*d**2 + 30*B**2*b**3*d**2))/(2*g**2*i**3*(a*d - b*c)*
*4) + (-2*A*B*a**2*d**2 + 10*A*B*a*b*c*d + 6*A*B*a*b*d**2*x + 4*A*B*b**2*c*
*2 + 18*A*B*b**2*c*d*x + 12*A*B*b**2*d**2*x**2 + B**2*a**2*d**2 - 11*B**2*a
*b*c*d - 9*B**2*a*b*d**2*x + 4*B**2*b**2*c**2 - 3*B**2*b**2*c*d*x - 6*B**2*
b**2*d**2*x**2)*log(e*(a + b*x)/(c + d*x))/(2*a**4*c**2*d**3*g**2*i**3 + 4*
a**4*c*d**4*g**2*i**3*x + 2*a**4*d**5*g**2*i**3*x**2 - 6*a**3*b*c**3*d**2*g
**2*i**3 - 10*a**3*b*c**2*d**3*g**2*i**3*x - 2*a**3*b*c*d**4*g**2*i**3*x**2
 + 2*a**3*b*d**5*g**2*i**3*x**3 + 6*a**2*b**2*c**4*d*g**2*i**3 + 6*a**2*b**
2*c**3*d**2*g**2*i**3*x - 6*a**2*b**2*c**2*d**3*g**2*i**3*x**2 - 6*a**2*b**
2*c*d**4*g**2*i**3*x**3 - 2*a*b**3*c**5*g**2*i**3 + 2*a*b**3*c**4*d*g**2*i*
*3*x + 10*a*b**3*c**3*d**2*g**2*i**3*x**2 + 6*a*b**3*c**2*d**3*g**2*i**3*x*
*3 - 2*b**4*c**5*g**2*i**3*x - 4*b**4*c**4*d*g**2*i**3*x**2 - 2*b**4*c**3*d
**2*g**2*i**3*x**3) + (-6*A*B*a*b**2*c**2*d - 12*A*B*a*b**2*c*d**2*x - 6*A*
B*a*b**2*d**3*x**2 - 6*A*B*b**3*c**2*d*x - 12*A*B*b**3*c*d**2*x**2 - 6*A*B*
b**3*d**3*x**3 - B**2*a**3*d**3 + 6*B**2*a**2*b*c*d**2 + 3*B**2*a**2*b*d**3
*x + 12*B**2*a*b**2*c*d**2*x + 9*B**2*a*b**2*d**3*x**2 - 2*B**2*b**3*c**3 -
 6*B**2*b**3*c**2*d*x + 3*B**2*b**3*d**3*x**3)*log(e*(a + b*x)/(c + d*x))**
2/(2*a**5*c**2*d**4*g**2*i**3 + 4*a**5*c*d**5*g**2*i**3*x + 2*a**5*d**6*g**
2*i**3*x**2 - 8*a**4*b*c**3*d**3*g**2*i**3 - 14*a**4*b*c**2*d**4*g**2*i**3*
x - 4*a**4*b*c*d**5*g**2*i**3*x**2 + 2*a**4*b*d**6*g**2*i**3*x**3 + 12*a**3
*b**2*c**4*d**2*g**2*i**3 + 16*a**3*b**2*c**3*d**3*g**2*i**3*x - 4*a**3*b**
2*c**2*d**4*g**2*i**3*x**2 - 8*a**3*b**2*c*d**5*g**2*i**3*x**3 - 8*a**2*b**
3*c**5*d*g**2*i**3 - 4*a**2*b**3*c**4*d**2*g**2*i**3*x + 16*a**2*b**3*c**3*
d**3*g**2*i**3*x**2 + 12*a**2*b**3*c**2*d**4*g**2*i**3*x**3 + 2*a*b**4*c**6
*g**2*i**3 - 4*a*b**4*c**5*d*g**2*i**3*x - 14*a*b**4*c**4*d**2*g**2*i**3*x*
*2 - 8*a*b**4*c**3*d**3*g**2*i**3*x**3 + 2*b**5*c**6*g**2*i**3*x + 4*b**5*c
**5*d*g**2*i**3*x**2 + 2*b**5*c**4*d**2*g**2*i**3*x**3) + (-2*A**2*a**2*d**
2 + 10*A**2*a*b*c*d + 4*A**2*b**2*c**2 + 2*A*B*a**2*d**2 - 22*A*B*a*b*c*d +
 8*A*B*b**2*c**2 - B**2*a**2*d**2 + 23*B**2*a*b*c*d + 8*B**2*b**2*c**2 + x*
*2*(12*A**2*b**2*d**2 - 12*A*B*b**2*d**2 + 30*B**2*b**2*d**2) + x*(6*A**2*a
*b*d**2 + 18*A**2*b**2*c*d - 18*A*B*a*b*d**2 - 6*A*B*b**2*c*d + 21*B**2*a*b
*d**2 + 39*B**2*b**2*c*d))/(4*a**4*c**2*d**3*g**2*i**3 - 12*a**3*b*c**3*d**
2*g**2*i**3 + 12*a**2*b**2*c**4*d*g**2*i**3 - 4*a*b**3*c**5*g**2*i**3 + x**
3*(4*a**3*b*d**5*g**2*i**3 - 12*a**2*b**2*c*d**4*g**2*i**3 + 12*a*b**3*c**2
*d**3*g**2*i**3 - 4*b**4*c**3*d**2*g**2*i**3) + x**2*(4*a**4*d**5*g**2*i**3
 - 4*a**3*b*c*d**4*g**2*i**3 - 12*a**2*b**2*c**2*d**3*g**2*i**3 + 20*a*b**3
*c**3*d**2*g**2*i**3 - 8*b**4*c**4*d*g**2*i**3) + x*(8*a**4*c*d**4*g**2*i**
3 - 20*a**3*b*c**2*d**3*g**2*i**3 + 12*a**2*b**2*c**3*d**2*g**2*i**3 + 4*a*
b**3*c**4*d*g**2*i**3 - 4*b**4*c**5*g**2*i**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^2(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^2*(d*i*x + c*
i)^3), x)
```

3.106 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=685

$$\frac{2b^2d^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^3}{Bg^3i^3(bc-ad)^5}-\frac{b^4(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3i^3(a+bx)^2(bc-ad)^5}-\frac{b^4B(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3d(c+dx)}{g^3i^3(a}$$

```
[Out] (B^2*d^4*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*A*b*B*d^3*
(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (8*b*B^2*d^3*(a + b*x))/((b*
c - a*d)^5*g^3*i^3*(c + d*x)) + (8*b^3*B^2*d*(c + d*x))/((b*c - a*d)^5*g^3*
i^3*(a + b*x)) - (b^4*B^2*(c + d*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2
) + (8*b*B^2*d^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^5*g^3
*i^3*(c + d*x)) - (B*d^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*b^3*B*d*(c + d*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*(c + d*x
)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x
)^2) + (d^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a
*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])^2)/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(
c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^5*g^3*i^3
*(a + b*x)^2) + (2*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(B*(b*c
- a*d)^5*g^3*i^3)
```

Rubi [C] time = 9.57928, antiderivative size = 1921, normalized size of antiderivative = 2.8, number of steps used = 173, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*i*x)^3
),x]
```

```
[Out] -(b^2*B^2)/(4*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (15*b^2*B^2*d)/(2*(b*c -
 a*d)^4*g^3*i^3*(a + b*x)) + (B^2*d^2)/(4*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2
) + (15*b*B^2*d^2)/(2*(b*c - a*d)^4*g^3*i^3*(c + d*x)) + (15*b^2*B^2*d^2*Lo
g[a + b*x])/((b*c - a*d)^5*g^3*i^3) - (6*A*b^2*B*d^2*Log[a + b*x]^2)/((b*c
- a*d)^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*
c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
(c + d*x)^(-1)]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((b*c - a*
d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i^3)
- (6*b^2*B^2*d^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^
5*g^3*i^3) - (b^2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*
g^3*i^3*(a + b*x)^2) + (7*b^2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b
*c - a*d)^4*g^3*i^3*(a + b*x)) - (B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) - (7*b*B*d^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/((b*c - a*d)^4*g^3*i^3*(c + d*x)) - (b^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (3*b^2*d*(A
+ B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^3*i^3*(a + b*x)) + (d
^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^3*g^3*i^3*(c + d*
```

```
x)^2) + (3*b*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^3
*i^3*(c + d*x)) + (6*b^2*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x
)])^2)/((b*c - a*d)^5*g^3*i^3) - (15*b^2*B^2*d^2*Log[c + d*x])/((b*c - a*d)
^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^5*g^
3*i^3) + (12*A*b^2*B*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((
b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Lo
g[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^2*d^2*Log[-((d*(a + b*x))/(
b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d
*x)])*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (6*b^2*d^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (6*A*b^2*B*d^2
*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]*Log[
c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[(e*(a + b*x))/(c +
 d*x)]*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) - (2*b^2*B^2*d^2*Log[c + d*x
]^3)/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*Log[a + b*x]*Log[(b*(c + d*x
))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[a + b*x]^2*Lo
g[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*Pol
yLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^
2*d^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5
*g^3*i^3) + (12*A*b^2*B*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c -
a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^2*d^2*(Log[a + b*x] +
 Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*Log[(e*(a + b*x)
)/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^5*g^3*
i^3) + (12*b^2*B^2*d^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*
d)^5*g^3*i^3) + (12*b^2*B^2*d^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*
c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*
x))])/((b*c - a*d)^5*g^3*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
```

```
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
```

```
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
```

```
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(106c+106dx)^3(ag+bgx)^3}\,dx = \int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)^2} + \frac{3b^3d^2\left(A+\right.}{595508(bc}\right.$$

$$= \frac{\left(3b^3d^2\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx}\,dx}{595508(bc-ad)^5g^3} - \frac{\left(3b^2d^3\right)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx}\,dx}{595508(bc-ad)^5g^3} - \frac{\left(3b^3d\right)\int \frac{\left(A+B\,\mathrm{l}\right.}{(}}{1191016(bc}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\,\mathrm{l}\right.}{2382032(bc-}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\,\mathrm{l}\right.}{2382032(bc-}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\,\mathrm{l}\right.}{2382032(bc-}$$

$$= -\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\,\mathrm{l}\right.}{2382032(bc-}$$

$$= -\frac{b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1191016(bc-ad)^4g^3(a+bx)} - \frac{Bd^2\left(A+B\right.}{2382032(bc-}$$

$$= -\frac{b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1191016(bc-ad)^4g^3(a+bx)} - \frac{Bd^2\left(A+B\right.}{2382032(bc-}$$

$$= -\frac{3b^2B^2d^2\log(a+bx)\log^2\left(\frac{e(a+bx)}{c+dx}\right)}{595508(bc-ad)^5g^3} - \frac{b^2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bd\left(\right.}{1191016(}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} + \frac{B}{4764064(bc-}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} + \frac{B}{4764064(bc-}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} + \frac{B}{4764064(bc-}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} + \frac{B}{4764064(bc-}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} + \frac{B}{4764064(bc-}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} + \frac{B}{4764064(bc-}$$

$$= -\frac{b^2B^2}{4764064(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2d}{2382032(bc-ad)^4g^3(a+bx)} + \frac{B}{4764064(bc-}$$

Mathematica [A] time = 1.96067, size = 611, normalized size = 0.89

$$-2B\left(-6a^2b^2d^2\left(2A(c+dx)^2-Bdx(4c+3dx)\right)+4a^3bBd^3(2c+dx)-a^4Bd^4-4ab^3d\left(6Adx(c+dx)^2+B\left(6c^2dx+2c^3-\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^3*(c*i + d*
i*x)^3),x]
```

```
[Out] ((2*A^2 - 2*A*B + B^2)*d^2*(b*c - a*d)^2*(a + b*x)^2 + 2*b*(6*A^2 - 14*A*B
+ 15*B^2)*d^2*(b*c - a*d)*(a + b*x)^2*(c + d*x) - b^2*(2*A^2 + 2*A*B + B^2)
*(b*c - a*d)^2*(c + d*x)^2 + 2*b^2*(6*A^2 + 14*A*B + 15*B^2)*d*(b*c - a*d)*
(a + b*x)*(c + d*x)^2 + 12*b^2*(2*A^2 + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)^2*
Log[a + b*x] + 2*B*(b*c - a*d)*((2*A - B)*d^2*(b*c - a*d)*(a + b*x)^2 + 2*b
*(6*A - 7*B)*d^2*(a + b*x)^2*(c + d*x) - b^2*(2*A + B)*(b*c - a*d)*(c + d*x
)^2 + 2*b^2*(6*A + 7*B)*d*(a + b*x)*(c + d*x)^2)*Log[(e*(a + b*x))/(c + d*x
)] - 2*B*(-(a^4*B*d^4) + 4*a^3*b*B*d^3*(2*c + d*x) - 6*a^2*b^2*d^2*(2*A*(c
+ d*x)^2 - B*d*x*(4*c + 3*d*x)) + b^4*(-12*A*d^2*x^2*(c + d*x)^2 + B*c*(c^3
 - 4*c^2*d*x - 18*c*d^2*x^2 - 12*d^3*x^3)) - 4*a*b^3*d*(6*A*d*x*(c + d*x)^2
 + B*(2*c^3 + 6*c^2*d*x - 3*d^3*x^3)))*Log[(e*(a + b*x))/(c + d*x)]^2 + 8*b
^2*B^2*d^2*(a + b*x)^2*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]^3 - 12*b^2*
(2*A^2 + 5*B^2)*d^2*(a + b*x)^2*(c + d*x)^2*Log[c + d*x])/(4*(b*c - a*d)^5*
g^3*i^3*(a + b*x)^2*(c + d*x)^2)
```

Maple [B] time = 0.058, size = 4782, normalized size = 7.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] e^2*d/i^3/(a*d-b*c)^6/g^3*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+7/2*d^3/i^3/(a*d-b*c)^6/g^3*A^2*b^2*a+31/4*d
^3/i^3/(a*d-b*c)^6/g^3*B^2*b^2*a-31/4*d^2/i^3/(a*d-b*c)^6/g^3*B^2*b^3*c-7/2
*d^2/i^3/(a*d-b*c)^6/g^3*A^2*b^3*c+2*d^2/i^3/(a*d-b*c)^6/g^3*B^2*b^3*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))^3*c-15/2*d^3/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*b^2*a+15/2*d^2/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*b^3*c+1/2*d^5/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*x+c)^2*a^3-7/2*d^2/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))^2*b^3*c-6*d^3/i^3/(a*d-b*c)^6/g^3*A^2*b^2*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))*a+6*d^2/i^3/(a*d-b*c)^6/g^3*A^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*c+7/2*d^3/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b
^2*a-2*d^3/i^3/(a*d-b*c)^6/g^3*B^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a-
1/2*d^5/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2
*a^3+1/2*d^2/i^3/(a*d-b*c)^6/g^3*A^2/(d*x+c)^2*b^3*c^3+3*d^2/i^3/(a*d-b*c)^
6/g^3*A^2*b^3/(d*x+c)*c^2-1/2*e^2/i^3/(a*d-b*c)^6/g^3*A^2*b^5/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*c+15/2*d^4/i^3/(a*d-b*c)^6/g^3*B^2*b/(d*x+c)*a^2+1
5/2*d^2/i^3/(a*d-b*c)^6/g^3*B^2*b^3/(d*x+c)*c^2+1/4*d^2/i^3/(a*d-b*c)^6/g^3
*B^2/(d*x+c)^2*b^3*c^3+1/2*d^5/i^3/(a*d-b*c)^6/g^3*A*B/(d*x+c)^2*a^3-1/4*e^
2/i^3/(a*d-b*c)^6/g^3*B^2*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+3*d^4
/i^3/(a*d-b*c)^6/g^3*A^2*b/(d*x+c)*a^2-1/2*d^5/i^3/(a*d-b*c)^6/g^3*A^2/(d*x
+c)^2*a^3-1/4*d^5/i^3/(a*d-b*c)^6/g^3*B^2/(d*x+c)^2*a^3-4*e*d^2/i^3/(a*d-b*
c)^6/g^3*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))^2*a+4*e*d/i^3/(a*d-b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x
```

```
+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-8*e*d^2/i^3/(a*d-b*c)^6/g^3*B^
2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a
+8*e*d/i^3/(a*d-b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3/2*d^4/i^3/(a*d-b*c)^6/g^3*A*B/(d*x+c)^2*a^2
*b*c+3/2*d^3/i^3/(a*d-b*c)^6/g^3*A*B/(d*x+c)^2*a*b^2*c^2+14*d^3/i^3/(a*d-b*
c)^6/g^3*A*B*b^2/(d*x+c)*a*c-8*e*d^2/i^3/(a*d-b*c)^6/g^3*A*B*b^3/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)*a+8*e*d/i^3/(a*d-b*c)^6/g^3*A*B*b^4/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)*c-e^2/i^3/(a*d-b*c)^6/g^3*A*B*b^5/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+6*d^2/i^3/(a*d-b*c)^6
/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+1/2*e^2*d/i^3/(a*d
-b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))^2*a+1/2*e^2*d/i^3/(a*d-b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^2/i^3/(a*d-b*c)^6/g
^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+3*d^4/i^3/(a*d-b*c
)^6/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3*d^3/i^3/(a*
d-b*c)^6/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-12*d^3
/i^3/(a*d-b*c)^6/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c+8*
e*d/i^3/(a*d-b*c)^6/g^3*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*c-15/2*d^3/i^3/(a*d-b*c)^6/g^3*A*B*b^2*a+15/2*d^2/
i^3/(a*d-b*c)^6/g^3*A*B*b^3*c-3/2*d^3/i^3/(a*d-b*c)^6/g^3*A^2/(d*x+c)^2*a*b
^2*c^2-7*d^4/i^3/(a*d-b*c)^6/g^3*A*B*b/(d*x+c)*a^2-7*d^2/i^3/(a*d-b*c)^6/g^
3*A*B*b^3/(d*x+c)*c^2+1/2*d^2/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2/(d*x+c)^2*b^3*c^3+3*d^4/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2*b/(d*x+c)*a^2+3*d^2/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2*b^3/(d*x+c)*c^2-1/2*e^2/i^3/(a*d-b*c)^6/g^3*B^2*b^5/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-8
*e*d^2/i^3/(a*d-b*c)^6/g^3*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*a-7*d^2/i^3/(a*d-b*c)^6/g^3*A*B*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*b^3*c-7*d^4/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*b/(d*x+c)*a^2-7*d^2/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*b^3/(d*x+c)*c^2-6*d^3/i^3/(a*d-b*c)^6/g^3*A*B*b^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))^2*a-1/2*e^2/i^3/(a*d-b*c)^6/g^3*B^2*b^5/(b*e/d+e/(d*x+c)*
a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/2*d^2/i^3/(a*d-b*c
)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+6*d^2/i^3/(a*
d-b*c)^6/g^3*A*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^5/i^3/(a*d-b*c)^
6/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-4*e*d^2/i^3/(a*d-b*
c)^6/g^3*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+4*e*d/i^3/(a*d-b*c)^
6/g^3*A^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-8*e*d^2/i^3/(a*d-b*c)^6
/g^3*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+8*e*d/i^3/(a*d-b*c)^6/g^
3*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+1/4*e^2*d/i^3/(a*d-b*c)^6/g
^3*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+3/4*d^4/i^3/(a*d-b*c)^6/
g^3*B^2/(d*x+c)^2*a^2*b*c-3/4*d^3/i^3/(a*d-b*c)^6/g^3*B^2/(d*x+c)^2*a*b^2*c
^2-6*d^3/i^3/(a*d-b*c)^6/g^3*A^2*b^2/(d*x+c)*a*c-15*d^3/i^3/(a*d-b*c)^6/g^3
*B^2*b^2/(d*x+c)*a*c-1/2*d^2/i^3/(a*d-b*c)^6/g^3*A*B/(d*x+c)^2*b^3*c^3+7*d^
3/i^3/(a*d-b*c)^6/g^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-3/2*d^3/i^3
/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^2*c^2*a+
14*d^3/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*
a*c+3/2*d^3/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)
^2*b^2*c^2*a+3/2*d^4/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^2/(d*x+c)^2*a^2*b*c-3/2*d^4/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*x+c)^2*a^2*b*c+6*d^4/i^3/(a*d-b*c)^6/g^3*A*B*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))*b/(d*x+c)*a^2-6*d^3/i^3/(a*d-b*c)^6/g^3*B^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))^2*b^2/(d*x+c)*a*c+1/2*e^2*d/i^3/(a*d-b*c)^6/g^3*A*B*b^4/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2*e^2/i^3/(a*d-b*c)^6/g^3*A*B*b^5/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/2*e^2*d/i^3/(a*d-b*c)^6/g^3*A^2*b^
4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+3/2*d^4/i^3/(a*d-b*c)^6/g^3*A^2/(
d*x+c)^2*a^2*b*c
```

Maxima [B] time = 3.48238, size = 7537, normalized size = 11.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] 1/2*B^2*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^
3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d
^3)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^
5 + a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c
^3*d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^
6*c^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^
6)*g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4
*b^2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^
3*b^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) +
 12*b^2*d^2*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 1
0*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x
+ c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 +
5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 +
 A*B*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 +
 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)
*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 +
 a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*
d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c
^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)*
g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^
2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b
^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 12
*b^2*d^2*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a
^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x + c
)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a
^4*b*c*d^4 - a^5*d^5)*g^3*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/4*
B^2*(2*(b^4*c^4 - 16*a*b^3*c^3*d + 30*a^2*b^2*c^2*d^2 - 16*a^3*b*c*d^3 + a^
4*d^4 - 12*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 12*(b^4*d^4*x^
4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^
3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x +
 a)^2 - 24*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 +
 (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b
^2*c*d^3)*x)*log(b*x + a)*log(d*x + c) + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2
+ 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^
4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(d*x + c)^2 - 12*(b^4*c^3*
d - a*b^3*c^2*d^2 - a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*e*x/(d*x + c) + a*e
/(d*x + c))/(a^2*b^5*c^7*g^3*i^3 - 5*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5
*d^2*g^3*i^3 - 10*a^5*b^2*c^4*d^3*g^3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c
^2*d^5*g^3*i^3 + (b^7*c^5*d^2*g^3*i^3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^
5*c^3*d^4*g^3*i^3 - 10*a^3*b^4*c^2*d^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 -
a^5*b^2*d^7*g^3*i^3)*x^4 + 2*(b^7*c^6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 +
 5*a^2*b^5*c^4*d^3*g^3*i^3 - 5*a^4*b^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^
3*i^3 - a^6*b*d^7*g^3*i^3)*x^3 + (b^7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9
*a^2*b^5*c^5*d^2*g^3*i^3 + 25*a^3*b^4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*
g^3*i^3 + 9*a^5*b^2*c^2*d^5*g^3*i^3 + a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3
)*x^2 + 2*(a*b^6*c^7*g^3*i^3 - 4*a^2*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*
g^3*i^3 - 5*a^5*b^2*c^3*d^4*g^3*i^3 + 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g
^3*i^3)*x) + (b^4*c^4 - 32*a*b^3*c^3*d + 32*a^3*b*c*d^3 - a^4*d^4 - 60*(b^4
*c*d^3 - a*b^3*d^4)*x^3 - 8*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 +
 a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^
```

```
3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)^3 - 24*(b^4*d^4*x^4 + a^2*b^2*c^
2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*
b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*x +
c)^2 + 8*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (
b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2
*c*d^3)*x)*log(d*x + c)^3 - 90*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^2 - 4*(7*b^4*c
^3*d + 24*a*b^3*c^2*d^2 - 24*a^2*b^2*c*d^3 - 7*a^3*b*d^4)*x - 60*(b^4*d^4*x
^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b
^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x
+ a) + 12*(5*b^4*d^4*x^4 + 5*a^2*b^2*c^2*d^2 + 10*(b^4*c*d^3 + a*b^3*d^4)*x
^3 + 5*(b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(b^4*d^4*x^4 + a
^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d
^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)^2
 + 10*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(d*x + c))/(a^2*b^5*c^7*g^3*i^3
 - 5*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^2*c^4*d^
3*g^3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^5*d^2*g^
3*i^3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a^3*b^4*c
^2*d^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4 + 2*(b^
7*c^6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i^3 - 5*a
^4*b^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^3)*x^3 +
 (b^7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3 + 25*a^
3*b^4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2*d^5*g^3*
i^3 + a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3*i^3 - 4
*a^2*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3*d^4*g^3*
i^3 + 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x)) + 1/2*A^2*((12*b^3*d
^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2
+ a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((b^6*c^4*d
^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 + a^4*b^2*d^6)*g
^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*d^3 + 2*a^3*b^3
*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c^6 - 9*a^2*b^4*
c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)*g^3*i^3*x^2 + 2
*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^2*c^3*d^3 - 3*a
^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b^3*c^5*d + 6*a^
4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 12*b^2*d^2*log(b*
x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3
+ 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x + c)/((b^5*c^5 - 5
*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^
5*d^5)*g^3*i^3)) - 1/2*(b^4*c^4 - 16*a*b^3*c^3*d + 30*a^2*b^2*c^2*d^2 - 16*
a^3*b*c*d^3 + a^4*d^4 - 12*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2
+ 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*
c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d
^3)*x)*log(b*x + a)^2 - 24*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 +
a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3
*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*x + c) + 12*(b^4*d^4*x^4 +
a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*
d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(d*x + c)^
2 - 12*(b^4*c^3*d - a*b^3*c^2*d^2 - a^2*b^2*c*d^3 + a^3*b*d^4)*x)*A*B/(a^2*
b^5*c^7*g^3*i^3 - 5*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10
*a^5*b^2*c^4*d^3*g^3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 +
(b^7*c^5*d^2*g^3*i^3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3
 - 10*a^3*b^4*c^2*d^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i
^3)*x^4 + 2*(b^7*c^6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^
3*g^3*i^3 - 5*a^4*b^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7
*g^3*i^3)*x^3 + (b^7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*
g^3*i^3 + 25*a^3*b^4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b
^2*c^2*d^5*g^3*i^3 + a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*
c^7*g^3*i^3 - 4*a^2*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b
^2*c^3*d^4*g^3*i^3 + 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x)
```

Fricas [B] time = 0.698954, size = 3056, normalized size = 4.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/4*(60*A*B*a^2*b^2*c^2*d^2 + (2*A^2 + 2*A*B + B^2)*b^4*c^4 - 16*(A^2 + 2*
A*B + 2*B^2)*a*b^3*c^3*d + 16*(A^2 - 2*A*B + 2*B^2)*a^3*b*c*d^3 - (2*A^2 -
2*A*B + B^2)*a^4*d^4 - 12*((2*A^2 + 5*B^2)*b^4*c*d^3 - (2*A^2 + 5*B^2)*a*b^
3*d^4)*x^3 - 8*(B^2*b^4*d^4*x^4 + B^2*a^2*b^2*c^2*d^2 + 2*(B^2*b^4*c*d^3 +
B^2*a*b^3*d^4)*x^3 + (B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4
)*x^2 + 2*(B^2*a*b^3*c^2*d^2 + B^2*a^2*b^2*c*d^3)*x)*log((b*e*x + a*e)/(d*x
 + c))^3 + 6*(8*A*B*a*b^3*c*d^3 - (6*A^2 + 4*A*B + 15*B^2)*b^4*c^2*d^2 + (6
*A^2 - 4*A*B + 15*B^2)*a^2*b^2*d^4)*x^2 - 2*(12*A*B*b^4*d^4*x^4 - B^2*b^4*c
^4 + 8*B^2*a*b^3*c^3*d + 12*A*B*a^2*b^2*c^2*d^2 - 8*B^2*a^3*b*c*d^3 + B^2*a
^4*d^4 + 12*((2*A*B + B^2)*b^4*c*d^3 + (2*A*B - B^2)*a*b^3*d^4)*x^3 + 6*(8*
A*B*a*b^3*c*d^3 + (2*A*B + 3*B^2)*b^4*c^2*d^2 + (2*A*B - 3*B^2)*a^2*b^2*d^4
)*x^2 + 4*(B^2*b^4*c^3*d - B^2*a^3*b*d^4 + 6*(A*B + B^2)*a*b^3*c^2*d^2 + 6*
(A*B - B^2)*a^2*b^2*c*d^3)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 4*((2*A^2 +
6*A*B + 7*B^2)*b^4*c^3*d + 6*(2*A^2 - A*B + 4*B^2)*a*b^3*c^2*d^2 - 6*(2*A^2
 + A*B + 4*B^2)*a^2*b^2*c*d^3 - (2*A^2 - 6*A*B + 7*B^2)*a^3*b*d^4)*x - 2*(6
*(2*A^2 + 5*B^2)*b^4*d^4*x^4 + 12*A^2*a^2*b^2*c^2*d^2 - (2*A*B + B^2)*b^4*c
^4 + 16*(A*B + B^2)*a*b^3*c^3*d - 16*(A*B - B^2)*a^3*b*c*d^3 + (2*A*B - B^2
)*a^4*d^4 + 12*((2*A^2 + 2*A*B + 5*B^2)*b^4*c*d^3 + (2*A^2 - 2*A*B + 5*B^2)
*a*b^3*d^4)*x^3 + 6*((2*A^2 + 6*A*B + 7*B^2)*b^4*c^2*d^2 + 8*(A^2 + 2*B^2)*
a*b^3*c*d^3 + (2*A^2 - 6*A*B + 7*B^2)*a^2*b^2*d^4)*x^2 + 4*((2*A*B + 3*B^2)
*b^4*c^3*d + 6*(A^2 + 2*A*B + 2*B^2)*a*b^3*c^2*d^2 + 6*(A^2 - 2*A*B + 2*B^2
)*a^2*b^2*c*d^3 - (2*A*B - 3*B^2)*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x + c)
))/((b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2*d^
5 + 5*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*i^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6*c^5
*d^2 + 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d^7)
*g^3*i^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c^4*
d^3 - 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^3*i
^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*c^3
*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*i^3*x + (a^2*b^5*c^7 - 5*a^3*b^4*c^
6*d + 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^2*d
^5)*g^3*i^3)
```

Sympy [B] time = 142.653, size = 3720, normalized size = 5.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**3,x)
```

```
[Out] -2*B**2*b**2*d**2*log(e*(a + b*x)/(c + d*x))**3/(a**5*d**5*g**3*i**3 - 5*a*
*4*b*c*d**4*g**3*i**3 + 10*a**3*b**2*c**2*d**3*g**3*i**3 - 10*a**2*b**3*c**
3*d**2*g**3*i**3 + 5*a*b**4*c**4*d*g**3*i**3 - b**5*c**5*g**3*i**3) + 3*b**
2*d**2*(2*A**2 + 5*B**2)*log(x + (6*A**2*a*b**2*d**3 + 6*A**2*b**3*c*d**2 +
 15*B**2*a*b**2*d**3 + 15*B**2*b**3*c*d**2 - 3*a**6*b**2*d**8*(2*A**2 + 5*B
**2)/(a*d - b*c)**5 + 18*a**5*b**3*c*d**7*(2*A**2 + 5*B**2)/(a*d - b*c)**5
```

- 45*a**4*b**4*c**2*d**6*(2*A**2 + 5*B**2)/(a*d - b*c)**5 + 60*a**3*b**5*c*
*3*d**5*(2*A**2 + 5*B**2)/(a*d - b*c)**5 - 45*a**2*b**6*c**4*d**4*(2*A**2 +
 5*B**2)/(a*d - b*c)**5 + 18*a*b**7*c**5*d**3*(2*A**2 + 5*B**2)/(a*d - b*c)
5 - 3*b8*c**6*d**2*(2*A**2 + 5*B**2)/(a*d - b*c)**5)/(12*A**2*b**3*d**3
 + 30*B**2*b**3*d**3))/(g**3*i**3*(a*d - b*c)**5) - 3*b**2*d**2*(2*A**2 + 5
*B**2)*log(x + (6*A**2*a*b**2*d**3 + 6*A**2*b**3*c*d**2 + 15*B**2*a*b**2*d*
*3 + 15*B**2*b**3*c*d**2 + 3*a**6*b**2*d**8*(2*A**2 + 5*B**2)/(a*d - b*c)**
5 - 18*a**5*b**3*c*d**7*(2*A**2 + 5*B**2)/(a*d - b*c)**5 + 45*a**4*b**4*c**
2*d**6*(2*A**2 + 5*B**2)/(a*d - b*c)**5 - 60*a**3*b**5*c**3*d**5*(2*A**2 +
5*B**2)/(a*d - b*c)**5 + 45*a**2*b**6*c**4*d**4*(2*A**2 + 5*B**2)/(a*d - b*
c)**5 - 18*a*b**7*c**5*d**3*(2*A**2 + 5*B**2)/(a*d - b*c)**5 + 3*b**8*c**6*
d**2*(2*A**2 + 5*B**2)/(a*d - b*c)**5)/(12*A**2*b**3*d**3 + 30*B**2*b**3*d*
*3))/(g**3*i**3*(a*d - b*c)**5) + (-2*A*B*a**3*d**3 + 14*A*B*a**2*b*c*d**2
+ 8*A*B*a**2*b*d**3*x + 14*A*B*a*b**2*c**2*d + 56*A*B*a*b**2*c*d**2*x + 36*
A*B*a*b**2*d**3*x**2 - 2*A*B*b**3*c**3 + 8*A*B*b**3*c**2*d*x + 36*A*B*b**3*
c*d**2*x**2 + 24*A*B*b**3*d**3*x**3 + B**2*a**3*d**3 - 15*B**2*a**2*b*c*d**
2 - 12*B**2*a**2*b*d**3*x + 15*B**2*a*b**2*c**2*d - 12*B**2*a*b**2*d**3*x**
2 - B**2*b**3*c**3 + 12*B**2*b**3*c**2*d*x + 12*B**2*b**3*c*d**2*x**2)*log(
e*(a + b*x)/(c + d*x))/(2*a**6*c**2*d**4*g**3*i**3 + 4*a**6*c*d**5*g**3*i**
3*x + 2*a**6*d**6*g**3*i**3*x**2 - 8*a**5*b*c**3*d**3*g**3*i**3 - 12*a**5*b
*c**2*d**4*g**3*i**3*x + 4*a**5*b*d**6*g**3*i**3*x**3 + 12*a**4*b**2*c**4*d
2*g3*i**3 + 8*a**4*b**2*c**3*d**3*g**3*i**3*x - 18*a**4*b**2*c**2*d**4*
g**3*i**3*x**2 - 12*a**4*b**2*c*d**5*g**3*i**3*x**3 + 2*a**4*b**2*d**6*g**3
*i**3*x**4 - 8*a**3*b**3*c**5*d*g**3*i**3 + 8*a**3*b**3*c**4*d**2*g**3*i**3
*x + 32*a**3*b**3*c**3*d**3*g**3*i**3*x**2 + 8*a**3*b**3*c**2*d**4*g**3*i**
3*x**3 - 8*a**3*b**3*c*d**5*g**3*i**3*x**4 + 2*a**2*b**4*c**6*g**3*i**3 - 1
2*a**2*b**4*c**5*d*g**3*i**3*x - 18*a**2*b**4*c**4*d**2*g**3*i**3*x**2 + 8*
a**2*b**4*c**3*d**3*g**3*i**3*x**3 + 12*a**2*b**4*c**2*d**4*g**3*i**3*x**4
+ 4*a*b**5*c**6*g**3*i**3*x - 12*a*b**5*c**4*d**2*g**3*i**3*x**3 - 8*a*b**5
*c**3*d**3*g**3*i**3*x**4 + 2*b**6*c**6*g**3*i**3*x**2 + 4*b**6*c**5*d*g**3
*i**3*x**3 + 2*b**6*c**4*d**2*g**3*i**3*x**4) + (-12*A*B*a**2*b**2*c**2*d**
2 - 24*A*B*a**2*b**2*c*d**3*x - 12*A*B*a**2*b**2*d**4*x**2 - 24*A*B*a*b**3*
c**2*d**2*x - 48*A*B*a*b**3*c*d**3*x**2 - 24*A*B*a*b**3*d**4*x**3 - 12*A*B*
b**4*c**2*d**2*x**2 - 24*A*B*b**4*c*d**3*x**3 - 12*A*B*b**4*d**4*x**4 - B**
2*a**4*d**4 + 8*B**2*a**3*b*c*d**3 + 4*B**2*a**3*b*d**4*x + 24*B**2*a**2*b*
*2*c*d**3*x + 18*B**2*a**2*b**2*d**4*x**2 - 8*B**2*a*b**3*c**3*d - 24*B**2*
a*b**3*c**2*d**2*x + 12*B**2*a*b**3*d**4*x**3 + B**2*b**4*c**4 - 4*B**2*b**
4*c**3*d*x - 18*B**2*b**4*c**2*d**2*x**2 - 12*B**2*b**4*c*d**3*x**3)*log(e*
(a + b*x)/(c + d*x))**2/(2*a**7*c**2*d**5*g**3*i**3 + 4*a**7*c*d**6*g**3*i*
*3*x + 2*a**7*d**7*g**3*i**3*x**2 - 10*a**6*b*c**3*d**4*g**3*i**3 - 16*a**6
*b*c**2*d**5*g**3*i**3*x - 2*a**6*b*c*d**6*g**3*i**3*x**2 + 4*a**6*b*d**7*g
3*i3*x**3 + 20*a**5*b**2*c**4*d**3*g**3*i**3 + 20*a**5*b**2*c**3*d**4*g
3*i3*x - 18*a**5*b**2*c**2*d**5*g**3*i**3*x**2 - 16*a**5*b**2*c*d**6*g*
*3*i**3*x**3 + 2*a**5*b**2*d**7*g**3*i**3*x**4 - 20*a**4*b**3*c**5*d**2*g**
3*i**3 + 50*a**4*b**3*c**3*d**4*g**3*i**3*x**2 + 20*a**4*b**3*c**2*d**5*g**
3*i**3*x**3 - 10*a**4*b**3*c*d**6*g**3*i**3*x**4 + 10*a**3*b**4*c**6*d*g**3
*i**3 - 20*a**3*b**4*c**5*d**2*g**3*i**3*x - 50*a**3*b**4*c**4*d**3*g**3*i*
*3*x**2 + 20*a**3*b**4*c**2*d**5*g**3*i**3*x**4 - 2*a**2*b**5*c**7*g**3*i**
3 + 16*a**2*b**5*c**6*d*g**3*i**3*x + 18*a**2*b**5*c**5*d**2*g**3*i**3*x**2
 - 20*a**2*b**5*c**4*d**3*g**3*i**3*x**3 - 20*a**2*b**5*c**3*d**4*g**3*i**3
*x**4 - 4*a*b**6*c**7*g**3*i**3*x + 2*a*b**6*c**6*d*g**3*i**3*x**2 + 16*a*b
6*c5*d**2*g**3*i**3*x**3 + 10*a*b**6*c**4*d**3*g**3*i**3*x**4 - 2*b**7*
c**7*g**3*i**3*x**2 - 4*b**7*c**6*d*g**3*i**3*x**3 - 2*b**7*c**5*d**2*g**3*
i**3*x**4) + (-2*A**2*a**3*d**3 + 14*A**2*a**2*b*c*d**2 + 14*A**2*a*b**2*c*
*2*d - 2*A**2*b**3*c**3 + 2*A*B*a**3*d**3 - 30*A*B*a**2*b*c*d**2 + 30*A*B*a
*b**2*c**2*d - 2*A*B*b**3*c**3 - B**2*a**3*d**3 + 31*B**2*a**2*b*c*d**2 + 3
1*B**2*a*b**2*c**2*d - B**2*b**3*c**3 + x**3*(24*A**2*b**3*d**3 + 60*B**2*b
3*d3) + x**2*(36*A**2*a*b**2*d**3 + 36*A**2*b**3*c*d**2 - 24*A*B*a*b**2
*d**3 + 24*A*B*b**3*c*d**2 + 90*B**2*a*b**2*d**3 + 90*B**2*b**3*c*d**2) + x

```
*(8*A**2*a**2*b*d**3 + 56*A**2*a*b**2*c*d**2 + 8*A**2*b**3*c**2*d - 24*A*B*
a**2*b*d**3 + 24*A*B*b**3*c**2*d + 28*B**2*a**2*b*d**3 + 124*B**2*a*b**2*c*
d**2 + 28*B**2*b**3*c**2*d))/(4*a**6*c**2*d**4*g**3*i**3 - 16*a**5*b*c**3*d
**3*g**3*i**3 + 24*a**4*b**2*c**4*d**2*g**3*i**3 - 16*a**3*b**3*c**5*d*g**3
*i**3 + 4*a**2*b**4*c**6*g**3*i**3 + x**4*(4*a**4*b**2*d**6*g**3*i**3 - 16*
a**3*b**3*c*d**5*g**3*i**3 + 24*a**2*b**4*c**2*d**4*g**3*i**3 - 16*a*b**5*c
**3*d**3*g**3*i**3 + 4*b**6*c**4*d**2*g**3*i**3) + x**3*(8*a**5*b*d**6*g**3
*i**3 - 24*a**4*b**2*c*d**5*g**3*i**3 + 16*a**3*b**3*c**2*d**4*g**3*i**3 +
16*a**2*b**4*c**3*d**3*g**3*i**3 - 24*a*b**5*c**4*d**2*g**3*i**3 + 8*b**6*c
**5*d*g**3*i**3) + x**2*(4*a**6*d**6*g**3*i**3 - 36*a**4*b**2*c**2*d**4*g**
3*i**3 + 64*a**3*b**3*c**3*d**3*g**3*i**3 - 36*a**2*b**4*c**4*d**2*g**3*i**
3 + 4*b**6*c**6*g**3*i**3) + x*(8*a**6*c*d**5*g**3*i**3 - 24*a**5*b*c**2*d*
*4*g**3*i**3 + 16*a**4*b**2*c**3*d**3*g**3*i**3 + 16*a**3*b**3*c**4*d**2*g*
*3*i**3 - 24*a**2*b**4*c**5*d*g**3*i**3 + 8*a*b**5*c**6*g**3*i**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^3(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^3*(d*i*x + c*
i)^3), x)
```

3.107 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=851

$$-\frac{2B^2(c+dx)^3b^5}{27(bc-ad)^6g^4i^3(a+bx)^3}-\frac{(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2b^5}{3(bc-ad)^6g^4i^3(a+bx)^3}-\frac{2B(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^5}{9(bc-ad)^6g^4i^3(a+bx)^3}+\frac{5B^2d(c}{4(bc-ad)^6}$$

```
[Out] -(B^2*d^5*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (10*A*b*B*d^
4*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (10*b*B^2*d^4*(a + b*x))/(
(b*c - a*d)^6*g^4*i^3*(c + d*x)) - (20*b^3*B^2*d^2*(c + d*x))/((b*c - a*d)^
6*g^4*i^3*(a + b*x)) + (5*b^4*B^2*d*(c + d*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(
a + b*x)^2) - (2*b^5*B^2*(c + d*x)^3)/(27*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3
) - (10*b*B^2*d^4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^6*g^
4*i^3*(c + d*x)) + (B*d^5*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (20*b^3*B*d^2*(c + d*x)*(A + B*Log
[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*
(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^6*g^4*i^3*
(a + b*x)^2) - (2*b^5*B*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
9*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (d^5*(a + b*x)^2*(A + B*Log[(e*(a +
b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a +
b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^6*g^4*i^3*(c + d*
x)) - (10*b^3*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c -
 a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/
(c + d*x)])^2)/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3)
- (10*b^2*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^3)/(3*B*(b*c - a*d)^6*g^
4*i^3)
```

Rubi [C] time = 10.9211, antiderivative size = 2454, normalized size of antiderivative = 2.88, number of steps used = 207, number of rules used = 31, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.738, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*i*x)^3
),x]
```

```
[Out] (-2*b^2*B^2)/(27*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (37*b^2*B^2*d)/(36*(b
*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (319*b^2*B^2*d^2)/(18*(b*c - a*d)^5*g^4*
i^3*(a + b*x)) - (B^2*d^3)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - (19*b*B^
2*d^3)/(2*(b*c - a*d)^5*g^4*i^3*(c + d*x)) - (245*b^2*B^2*d^3*Log[a + b*x])
/(9*(b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B*d^3*Log[a + b*x]^2)/((b*c - a*d)^6
*g^4*i^3) + (10*b^2*B^2*d^3*Log[a + b*x]^2)/(3*(b*c - a*d)^6*g^4*i^3) - (10
*b^2*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^6*g^4*i^3) +
(10*b^2*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/((
b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*L
og[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Lo
g[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) - (2*b^2
*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^3*g^4*i^3*(a + b*x)
^3) + (11*b^2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*(b*c - a*d)^4*g^
```

```
4*i^3*(a + b*x)^2) - (47*b^2*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3
*(b*c - a*d)^5*g^4*i^3*(a + b*x)) + (B*d^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B*d^3*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (20*b^2*B*d^3*Log[a
 + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^6*g^4*i^3) - (
b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*(b*c - a*d)^3*g^4*i^3*(a + b
*x)^3) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^4*
g^4*i^3*(a + b*x)^2) - (6*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(
(b*c - a*d)^5*g^4*i^3*(a + b*x)) - (d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)^2)/(2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - (4*b*d^3*(A + B*Log[(e*(a + b*
x))/(c + d*x)])^2)/((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*d^3*Log[a +
b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^6*g^4*i^3) + (245
*b^2*B^2*d^3*Log[c + d*x])/(9*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B^2*d^3*Log[
a + b*x]^2*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*Log[-((d
*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B
^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*(b*c - a*d)^6*g^4
*i^3) - (20*b^2*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b*
c - a*d)^6*g^4*i^3) + (20*b^2*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*(Lo
g[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*
x])/((b*c - a*d)^6*g^4*i^3) + (20*b^2*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d
*x)])*Log[c + d*x])/(3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*d^3*(A + B*Log[(e*(
a + b*x))/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B
*d^3*Log[c + d*x]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[c + d*x]
^2)/(3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B^2*d^3*Log[a + b*x]*Log[c + d*x]^2
)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*Lo
g[c + d*x]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[c + d*x]^3)/(3*
(b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*
c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*Log[a + b*x]*Log[(b*(c
 + d*x))/(b*c - a*d)])/(3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[a +
b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*
B*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^6*g^4*i^3) - (
20*b^2*B^2*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*(b*c - a*d)^6*g
^4*i^3) + (20*b^2*B^2*d^3*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)])/(3*(b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*Log[(c + d*x)
^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) + (20
*b^2*B^2*d^3*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d
*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (20*
b^2*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a +
 b*x))])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[3, -((d*(a + b*x
))/(b*c - a*d))])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[3, (b*(
c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[3
, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^6*g^4*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
```

```
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(107c+107dx)^3(ag+bgx)^4}\,dx = -\frac{2b^2B^2}{33076161(bc-ad)^3g^4(a+bx)^3} + \frac{37b^2B^2d}{44101548(bc-ad)^4g^4(a+bx)^2} - \frac{319b}{22050774(bc}$$

Mathematica [A] time = 2.81633, size = 793, normalized size = 0.93

$$-\frac{18B\left(30a^2b^3d^2\left(6Adx(c+dx)^2+B\left(6c^2dx+2c^3-3d^3x^3\right)\right)+30a^3b^2d^3\left(2A(c+dx)^2-Bdx(4c+3dx)\right)-15a^4bBd^4(2c+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*
i*x)^3),x]
```

```
[Out] -(27*(2*A^2 - 2*A*B + B^2)*d^3*(b*c - a*d)^2*(a + b*x)^3 + 54*b*(8*A^2 - 18
*A*B + 19*B^2)*d^3*(b*c - a*d)*(a + b*x)^3*(c + d*x) + 4*b^2*(9*A^2 + 6*A*B
 + 2*B^2)*(b*c - a*d)^3*(c + d*x)^2 - 3*b^2*(54*A^2 + 66*A*B + 37*B^2)*d*(b
```

```
*c - a*d)^2*(a + b*x)*(c + d*x)^2 + 6*b^2*(108*A^2 + 282*A*B + 319*B^2)*d^2
*(b*c - a*d)*(a + b*x)^2*(c + d*x)^2 + 60*b^2*(18*A^2 + 12*A*B + 49*B^2)*d^
3*(a + b*x)^3*(c + d*x)^2*Log[a + b*x] + 6*B*(b*c - a*d)*(9*(2*A - B)*d^3*(
b*c - a*d)*(a + b*x)^3 + 18*b*(8*A - 9*B)*d^3*(a + b*x)^3*(c + d*x) + 4*b^2
*(3*A + B)*(b*c - a*d)^2*(c + d*x)^2 - 3*b^2*(18*A + 11*B)*d*(b*c - a*d)*(a
 + b*x)*(c + d*x)^2 + 6*b^2*(36*A + 47*B)*d^2*(a + b*x)^2*(c + d*x)^2)*Log[
(e*(a + b*x))/(c + d*x)] + 18*B*(3*a^5*B*d^5 - 15*a^4*b*B*d^4*(2*c + d*x) +
 30*a^3*b^2*d^3*(2*A*(c + d*x)^2 - B*d*x*(4*c + 3*d*x)) + 30*a^2*b^3*d^2*(6
*A*d*x*(c + d*x)^2 + B*(2*c^3 + 6*c^2*d*x - 3*d^3*x^3)) + 15*a*b^4*d*(12*A*
d^2*x^2*(c + d*x)^2 + B*c*(-c^3 + 4*c^2*d*x + 18*c*d^2*x^2 + 12*d^3*x^3)) +
 b^5*(60*A*d^3*x^3*(c + d*x)^2 + B*(2*c^5 - 5*c^4*d*x + 20*c^3*d^2*x^2 + 11
0*c^2*d^3*x^3 + 100*c*d^4*x^4 + 20*d^5*x^5)))*Log[(e*(a + b*x))/(c + d*x)]^
2 + 360*b^2*B^2*d^3*(a + b*x)^3*(c + d*x)^2*Log[(e*(a + b*x))/(c + d*x)]^3
- 60*b^2*(18*A^2 + 12*A*B + 49*B^2)*d^3*(a + b*x)^3*(c + d*x)^2*Log[c + d*x
])/(108*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3*(c + d*x)^2)
```

Maple [B] time = 0.059, size = 5731, normalized size = 6.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 7.14518, size = 12531, normalized size = 14.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -1/6*B^2*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2
 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*
b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^
3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*
d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d
^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a
^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4
*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3
 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^
4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c
^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g
^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^
5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*
x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^
3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*x + a)/((b^6
*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2
*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d*x + c)/((b^
6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^
2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(b*e*x/(d*x + c) + a*e/(d
```

```
*x + c))^2 - 1/3*A*B*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2
*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*
x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3
*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 -
5*a*b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6
 - a^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^
4*d^3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*
b^2*d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3
*b^5*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a
^7*b*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 +
25*a^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6
- a^8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5
*d^2 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d
^6)*g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^
6*b^2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*
x + a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3
+ 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d
*x + c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3
 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(b*e*x/(d*x +
 c) + a*e/(d*x + c)) - 1/108*B^2*(6*(4*b^5*c^5 - 45*a*b^4*c^4*d + 360*a^2*b
^3*c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4 - 9*a^5*d^5 + 120*(b^5*c
*d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^4*c*d^4 - a^2*b^3*d^5)*x
^3 + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2*b^3*c*d^4 + 7*a^3*b^2*d
^5)*x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*
x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3
+ 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4
)*x)*log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3
*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*
b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a
^3*b^2*c*d^4)*x)*log(d*x + c)^2 - 5*(5*b^5*c^4*d - 108*a*b^4*c^3*d^2 + 78*a
^2*b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x + 120*(b^5*d^5*x^5 + a^
3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*
d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5
)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a) - 120*(b^5*d^
5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 +
6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a
^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 3*(b^5*d^5*x^5
+ a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^
4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2
*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x
+ c))*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5
*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 +
15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3
+ (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i
^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*
d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6
*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*
a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4
*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g
^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b
^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3
+ 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^
3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^
4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a
^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 3
3*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*
g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^
7*g^4*i^3)*x) + (8*b^5*c^5 - 135*a*b^4*c^4*d + 2160*a^2*b^3*c^3*d^2 - 980*a
^3*b^2*c^2*d^3 - 1080*a^4*b*c*d^4 + 27*a^5*d^5 + 2940*(b^5*c*d^4 - a*b^4*d^
```

5)*x^4 + 30*(159*b^5*c^2*d^3 + 74*a*b^4*c*d^4 - 233*a^2*b^3*d^5)*x^3 + 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^3 - 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(d*x + c)^3 + 10*(170*b^5*c^3*d^2 + 921*a*b^4*c^2*d^3 - 588*a^2*b^3*c*d^4 - 503*a^3*b^2*d^5)*x^2 - 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x + c)^2 - 5*(19*b^5*c^4*d - 756*a*b^4*c^3*d^2 - 708*a^2*b^3*c^2*d^3 + 1256*a^3*b^2*c*d^4 + 189*a^4*b*d^5)*x + 2940*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a) - 60*(49*b^5*d^5*x^5 + 49*a^3*b^2*c^2*d^3 + 49*(2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + 49*(b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + 49*(3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + 18*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 + 49*(3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 12*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x)) - 1/6*A^2*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*

```
a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*
a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4
 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*
d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5
)*g^4*i^3) + 60*b^2*d^3*log(b*x + a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4
*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^
6)*g^4*i^3) - 60*b^2*d^3*log(d*x + c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^
4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d
^6)*g^4*i^3)) - 1/18*(4*b^5*c^5 - 45*a*b^4*c^4*d + 360*a^2*b^3*c^3*d^2 - 49
0*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4 - 9*a^5*d^5 + 120*(b^5*c*d^4 - a*b^4*d^
5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^4*c*d^4 - a^2*b^3*d^5)*x^3 + 20*(11*b^5
*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2*b^3*c*d^4 + 7*a^3*b^2*d^5)*x^2 - 180*(
b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*
d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d
^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x +
a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4
 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6
*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x
)*log(d*x + c)^2 - 5*(5*b^5*c^4*d - 108*a*b^4*c^3*d^2 + 78*a^2*b^3*c^2*d^3
+ 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x + 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 +
 (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3
*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*
b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a) - 120*(b^5*d^5*x^5 + a^3*b^2
*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 +
 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2
 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d
^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2
*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*
a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x + c))*A*B/(a^3*
b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20
*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4
*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3
 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2
*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*
c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^
3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4
*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4
*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5
*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3
- 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^
3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*
d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*
a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 1
6*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g
^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c
^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x)
```

Fricas [B] time = 0.804615, size = 4744, normalized size = 5.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/108*(4*(9*A^2 + 6*A*B + 2*B^2)*b^5*c^5 - 135*(2*A^2 + 2*A*B + B^2)*a*b^4
*c^4*d + 1080*(A^2 + 2*A*B + 2*B^2)*a^2*b^3*c^3*d^2 - 20*(18*A^2 + 147*A*B
```

```
+ 49*B^2)*a^3*b^2*c^2*d^3 - 540*(A^2 - 2*A*B + 2*B^2)*a^4*b*c*d^4 + 27*(2*A
^2 - 2*A*B + B^2)*a^5*d^5 + 60*((18*A^2 + 12*A*B + 49*B^2)*b^5*c*d^4 - (18*
A^2 + 12*A*B + 49*B^2)*a*b^4*d^5)*x^4 + 30*(3*(18*A^2 + 24*A*B + 53*B^2)*b^
5*c^2*d^3 + 2*(18*A^2 - 24*A*B + 37*B^2)*a*b^4*c*d^4 - (90*A^2 + 24*A*B + 2
33*B^2)*a^2*b^3*d^5)*x^3 + 360*(B^2*b^5*d^5*x^5 + B^2*a^3*b^2*c^2*d^3 + (2*
B^2*b^5*c*d^4 + 3*B^2*a*b^4*d^5)*x^4 + (B^2*b^5*c^2*d^3 + 6*B^2*a*b^4*c*d^4
 + 3*B^2*a^2*b^3*d^5)*x^3 + (3*B^2*a*b^4*c^2*d^3 + 6*B^2*a^2*b^3*c*d^4 + B^
2*a^3*b^2*d^5)*x^2 + (3*B^2*a^2*b^3*c^2*d^3 + 2*B^2*a^3*b^2*c*d^4)*x)*log((
b*e*x + a*e)/(d*x + c))^3 + 10*(2*(18*A^2 + 66*A*B + 85*B^2)*b^5*c^3*d^2 +
3*(126*A^2 + 84*A*B + 307*B^2)*a*b^4*c^2*d^3 - 12*(18*A^2 + 39*A*B + 49*B^2
)*a^2*b^3*c*d^4 - (198*A^2 - 84*A*B + 503*B^2)*a^3*b^2*d^5)*x^2 + 18*(20*(3
*A*B + B^2)*b^5*d^5*x^5 + 2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2*b
^3*c^3*d^2 + 60*A*B*a^3*b^2*c^2*d^3 - 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5 +
20*(9*A*B*a*b^4*d^5 + (6*A*B + 5*B^2)*b^5*c*d^4)*x^4 + 10*((6*A*B + 11*B^2)
*b^5*c^2*d^3 + 18*(2*A*B + B^2)*a*b^4*c*d^4 + 9*(2*A*B - B^2)*a^2*b^3*d^5)*
x^3 + 10*(2*B^2*b^5*c^3*d^2 + 36*A*B*a^2*b^3*c*d^4 + 9*(2*A*B + 3*B^2)*a*b^
4*c^2*d^3 + 3*(2*A*B - 3*B^2)*a^3*b^2*d^5)*x^2 - 5*(B^2*b^5*c^4*d - 12*B^2*
a*b^4*c^3*d^2 + 3*B^2*a^4*b*d^5 - 36*(A*B + B^2)*a^2*b^3*c^2*d^3 - 24*(A*B
- B^2)*a^3*b^2*c*d^4)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 5*((18*A^2 + 30*A
*B + 19*B^2)*b^5*c^4*d - 108*(2*A^2 + 6*A*B + 7*B^2)*a*b^4*c^3*d^2 - 12*(36
*A^2 - 39*A*B + 59*B^2)*a^2*b^3*c^2*d^3 + 8*(72*A^2 + 39*A*B + 157*B^2)*a^3
*b^2*c*d^4 + 27*(2*A^2 - 6*A*B + 7*B^2)*a^4*b*d^5)*x + 6*(10*(18*A^2 + 12*A
*B + 49*B^2)*b^5*d^5*x^5 + 180*A^2*a^3*b^2*c^2*d^3 + 4*(3*A*B + B^2)*b^5*c^
5 - 45*(2*A*B + B^2)*a*b^4*c^4*d + 360*(A*B + B^2)*a^2*b^3*c^3*d^2 - 180*(A
*B - B^2)*a^4*b*c*d^4 + 9*(2*A*B - B^2)*a^5*d^5 + 10*(2*(18*A^2 + 30*A*B +
55*B^2)*b^5*c*d^4 + 27*(2*A^2 + 5*B^2)*a*b^4*d^5)*x^4 + 10*((18*A^2 + 66*A*
B + 85*B^2)*b^5*c^2*d^3 + 54*(2*A^2 + 2*A*B + 5*B^2)*a*b^4*c*d^4 + 27*(2*A^
2 - 2*A*B + 5*B^2)*a^2*b^3*d^5)*x^3 + 10*(2*(6*A*B + 11*B^2)*b^5*c^3*d^2 +
27*(2*A^2 + 6*A*B + 7*B^2)*a*b^4*c^2*d^3 + 108*(A^2 + 2*B^2)*a^2*b^3*c*d^4
+ 9*(2*A^2 - 6*A*B + 7*B^2)*a^3*b^2*d^5)*x^2 - 5*((6*A*B + 5*B^2)*b^5*c^4*d
 - 36*(2*A*B + 3*B^2)*a*b^4*c^3*d^2 - 108*(A^2 + 2*A*B + 2*B^2)*a^2*b^3*c^2
*d^3 - 72*(A^2 - 2*A*B + 2*B^2)*a^3*b^2*c*d^4 + 9*(2*A*B - 3*B^2)*a^4*b*d^5
)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2
*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 +
a^6*b^3*d^8)*g^4*i^3*x^5 + (2*b^9*c^7*d - 9*a*b^8*c^6*d^2 + 12*a^2*b^7*c^5*
d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 + 33*a^5*b^4*c^2*d^6 - 16*a^6*
b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*i^3*x^4 + (b^9*c^8 - 18*a^2*b^7*c^6*d^2 + 52
*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4 + 24*a^5*b^4*c^3*d^5 + 10*a^6*b^3*c^2
*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8)*g^4*i^3*x^3 + (3*a*b^8*c^8 - 12*a^2*
b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b^5*c^5*d^3 - 60*a^5*b^4*c^4*d^4 +
52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 + a^9*d^8)*g^4*i^3*x^2 + (3*a^2*b^7
*c^8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2 - 30*a^5*b^4*c^5*d^3 + 5*a^6*b
^3*c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2*d^6 + 2*a^9*c*d^7)*g^4*i^3*x
+ (a^3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6*d^2 - 20*a^6*b^3*c^5*d^3
+ 15*a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*d^6)*g^4*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^4(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^4*(d*i*x + c*
i)^3), x)
```

3.108 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=223

$$\frac{g^3 i(a+bx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{20b^2}+\frac{g^3 i(a+bx)^4(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b}+\frac{Bg^3 in(a+bx)^2(b}{40b^2d^2}$$

```
[Out] -(B*(b*c - a*d)^4*g^3*i*n*x)/(20*b*d^3) + (B*(b*c - a*d)^3*g^3*i*n*(a + b*x
)^2)/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3)/(60*b^2*d) + (g^3
*i*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b) + ((
b*c - a*d)*g^3*i*(a + b*x)^4*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(20*b^2) + (B*(b*c - a*d)^5*g^3*i*n*Log[c + d*x])/(20*b^2*d^4)
```

Rubi [A] time = 0.385909, antiderivative size = 243, normalized size of antiderivative = 1.09, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 43}

$$\frac{g^3 i(a+bx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b^2}+\frac{dg^3 i(a+bx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^2}+\frac{Bg^3 in(a+bx)^2(bc-ad)^3}{40b^2d^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)^4*g^3*i*n*x)/(20*b*d^3) + (B*(b*c - a*d)^3*g^3*i*n*(a + b*x
)^2)/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3)/(60*b^2*d) - (B*(
b*c - a*d)*g^3*i*n*(a + b*x)^4)/(20*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^2) + (d*g^3*i*(a + b*x)^5*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^2) + (B*(b*c - a*d)^5*g^3*i*n*Log[c
 + d*x])/(20*b^2*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (108c+108dx)(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int \left(\frac{108(bc-ad)(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + \frac{108}{\ldots}\right.$$

$$= \frac{(108(bc-ad))\int (ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{b} + \ldots$$

$$= \frac{27(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2} + \frac{108dg^3(\ldots}{\ldots}$$

$$= \frac{27(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2} + \frac{108dg^3(\ldots}{\ldots}$$

$$= \frac{27(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2} + \frac{108dg^3(\ldots}{\ldots}$$

$$= -\frac{27B(bc-ad)^4g^3nx}{5bd^3} + \frac{27B(bc-ad)^3g^3n(a+bx)^2}{10b^2d^2} - \frac{9B(b\ldots}{\ldots}$$

Mathematica [A] time = 0.250617, size = 269, normalized size = 1.21

$$\frac{g^3i\left(24d(a+bx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+30(a+bx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{5Bn(bc-ad)^2\left(3d^2(a+bx)^2(ad-bc)+6bdx\ldots\right.}{\ldots}}{120\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g^3*i*(30*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) +
 24*d*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (5*B*(b*c - a*d)
^2*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a +
 b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/d^4 + (2*B*(b*c - a*d)*n*(12*b*d*(
b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b
*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]))/d^4))/(120*b^2)
```

Maple [F] time = 0.531, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^3(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.40488, size = 1509, normalized size = 6.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] 1/5*B*b^3*d*g^3*i*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A*b^3*d*
g^3*i*x^5 + 1/4*B*b^3*c*g^3*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
3/4*B*a*b^2*d*g^3*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b^3*
c*g^3*i*x^4 + 3/4*A*a*b^2*d*g^3*i*x^4 + B*a*b^2*c*g^3*i*x^3*log(e*(b*x/(d*x
 + c) + a/(d*x + c))^n) + B*a^2*b*d*g^3*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + A*a*b^2*c*g^3*i*x^3 + A*a^2*b*d*g^3*i*x^3 + 3/2*B*a^2*b*c*g^3*i
*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*B*a^3*d*g^3*i*x^2*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*a^2*b*c*g^3*i*x^2 + 1/2*A*a^3*d*g^3
*i*x^2 + 1/60*B*b^3*d*g^3*i*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c
)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3
+ 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/
24*B*b^3*c*g^3*i*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b
^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^
3*d^3)*x)/(b^3*d^3)) - 1/8*B*a*b^2*d*g^3*i*n*(6*a^4*log(b*x + a)/b^4 - 6*c^
4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*B*a*b^2*c*g^3*i*n*(2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/2*B*a^2*b*d*g^3*i*n*(2*a^3*log(b*x +
 a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2)) - 3/2*B*a^2*b*c*g^3*i*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 1/2*B*a^3*d*g^3*i*n*(a^2*log(b*x
+ a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^3*c*g^3*i*n*(a
*log(b*x + a)/b - c*log(d*x + c)/d) + B*a^3*c*g^3*i*x*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n) + A*a^3*c*g^3*i*x
```

Fricas [B] time = 0.847657, size = 1501, normalized size = 6.73

$$\frac{24\, Ab^5d^5g^3ix^5 + 6\left(5\, Ba^4bcd^4 - Ba^5d^5\right)g^3in\log\left(bx+a\right) + 6\left(Bb^5c^5 - 5\, Bab^4c^4d + 10\, Ba^2b^3c^3d^2 - 10\, Ba^3b^2c^2d^3\right)g^3in\, l}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] 1/120*(24*A*b^5*d^5*g^3*i*x^5 + 6*(5*B*a^4*b*c*d^4 - B*a^5*d^5)*g^3*i*n*log
(b*x + a) + 6*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 - 10*B*a^
3*b^2*c^2*d^3)*g^3*i*n*log(d*x + c) - 6*((B*b^5*c*d^4 - B*a*b^4*d^5)*g^3*i*
n - 5*(A*b^5*c*d^4 + 3*A*a*b^4*d^5)*g^3*i)*x^4 - 2*((B*b^5*c^2*d^3 + 10*B*a
*b^4*c*d^4 - 11*B*a^2*b^3*d^5)*g^3*i*n - 60*(A*a*b^4*c*d^4 + A*a^2*b^3*d^5)
*g^3*i)*x^3 + 3*((B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 - 5*B*a^2*b^3*c*d^4 + 9
*B*a^3*b^2*d^5)*g^3*i*n + 20*(3*A*a^2*b^3*c*d^4 + A*a^3*b^2*d^5)*g^3*i)*x^2
 + 6*(20*A*a^3*b^2*c*d^4*g^3*i - (B*b^5*c^4*d - 5*B*a*b^4*c^3*d^2 + 10*B*a^
```

```
2*b^3*c^2*d^3 - 5*B*a^3*b^2*c*d^4 - B*a^4*b*d^5)*g^3*i*n)*x + 6*(4*B*b^5*d^
5*g^3*i*x^5 + 20*B*a^3*b^2*c*d^4*g^3*i*x + 5*(B*b^5*c*d^4 + 3*B*a*b^4*d^5)*
g^3*i*x^4 + 20*(B*a*b^4*c*d^4 + B*a^2*b^3*d^5)*g^3*i*x^3 + 10*(3*B*a^2*b^3*
c*d^4 + B*a^3*b^2*d^5)*g^3*i*x^2)*log(e) + 6*(4*B*b^5*d^5*g^3*i*n*x^5 + 20*
B*a^3*b^2*c*d^4*g^3*i*n*x + 5*(B*b^5*c*d^4 + 3*B*a*b^4*d^5)*g^3*i*n*x^4 + 2
0*(B*a*b^4*c*d^4 + B*a^2*b^3*d^5)*g^3*i*n*x^3 + 10*(3*B*a^2*b^3*c*d^4 + B*a
^3*b^2*d^5)*g^3*i*n*x^2)*log((b*x + a)/(d*x + c)))/(b^2*d^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="giac")
```

```
[Out] Timed out
```

3.109 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=190

$$\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{12b^2}+\frac{g^2i(a+bx)^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b}-\frac{Bg^2in(bc-ad)^4}{12b^2d}$$

```
[Out] (B*(b*c - a*d)^3*g^2*i*n*x)/(12*b*d^2) - (B*(b*c - a*d)^2*g^2*i*n*(a + b*x)
^2)/(24*b^2*d) + (g^2*i*(a + b*x)^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*b) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A - B*n + B*Log[e*((a +
b*x)/(c + d*x))^n]))/(12*b^2) - (B*(b*c - a*d)^4*g^2*i*n*Log[c + d*x])/(12*
b^2*d^3)
```

Rubi [A] time = 0.315728, antiderivative size = 210, normalized size of antiderivative = 1.11, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 43}

$$\frac{g^2i(a+bx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^2}+\frac{dg^2i(a+bx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b^2}-\frac{Bg^2in(bc-ad)^4\log(c+dx)}{12b^2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*(b*c - a*d)^3*g^2*i*n*x)/(12*b*d^2) - (B*(b*c - a*d)^2*g^2*i*n*(a + b*x)
^2)/(24*b^2*d) - (B*(b*c - a*d)*g^2*i*n*(a + b*x)^3)/(12*b^2) + ((b*c - a*d
)*g^2*i*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2) + (d*g^
2*i*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^2) - (B*(b*c -
 a*d)^4*g^2*i*n*Log[c + d*x])/(12*b^2*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (109c+109dx)(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int\left(\frac{109(bc-ad)(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b}+\frac{10\ldots}{\ldots}\right.$$

$$=\frac{(109(bc-ad))\int(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{b}+\ldots$$

$$=\frac{109(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2}+\frac{109dg^2\ldots}{\ldots}$$

$$=\frac{109(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2}+\frac{109dg^2\ldots}{\ldots}$$

$$=\frac{109(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2}+\frac{109dg^2\ldots}{\ldots}$$

$$=\frac{109B(bc-ad)^3g^2nx}{12bd^2}-\frac{109B(bc-ad)^2g^2n(a+bx)^2}{24b^2d}-\frac{109B\ldots}{\ldots}$$

Mathematica [A] time = 0.16844, size = 225, normalized size = 1.18

$$\frac{g^2i\left(6d(a+bx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+8(a+bx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+\frac{4Bn(bc-ad)^2\left(2bdx(bc-ad)-2(bc-ad)^2\log(\ldots\right.}{d^3}\ldots\right.}{24b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g^2*i*(8*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) +
6*d*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (4*B*(b*c - a*d)^2
*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]))/
d^3 - (B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b
*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/d^3))/(24*b^2)
```

Maple [F] time = 0.528, size = 0, normalized size = 0.

$$\int\left(bgx+ag\right)^2(dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.37145, size = 999, normalized size = 5.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] 1/4*B*b^2*d*g^2*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b^2*d*
g^2*i*x^4 + 1/3*B*b^2*c*g^2*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
2/3*B*a*b*d*g^2*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*b^2*c*
g^2*i*x^3 + 2/3*A*a*b*d*g^2*i*x^3 + B*a*b*c*g^2*i*x^2*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n) + 1/2*B*a^2*d*g^2*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) + A*a*b*c*g^2*i*x^2 + 1/2*A*a^2*d*g^2*i*x^2 - 1/24*B*b^2*d*g^2*i*n*(6
*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
+ 1/6*B*b^2*c*g^2*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/3*B*a*b*d*
g^2*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*
d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - B*a*b*c*g^2*i*n*(a^2*log(b
*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 1/2*B*a^2*d*g^2
*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
B*a^2*c*g^2*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*a^2*c*g^2*i*x*log
(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a^2*c*g^2*i*x
```

Fricas [B] time = 0.659294, size = 1107, normalized size = 5.83

$$6\,Ab^4d^4g^2ix^4 + 2\left(4\,Ba^3bcd^3 - Ba^4d^4\right)g^2in\log\left(bx+a\right) - 2\left(Bb^4c^4 - 4\,Bab^3c^3d + 6\,Ba^2b^2c^2d^2\right)g^2in\log\left(dx+c\right) - 2\left(\left(B\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^2*i*x^4 + 2*(4*B*a^3*b*c*d^3 - B*a^4*d^4)*g^2*i*n*log(b
*x + a) - 2*(B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2)*g^2*i*n*log
(d*x + c) - 2*((B*b^4*c*d^3 - B*a*b^3*d^4)*g^2*i*n - 4*(A*b^4*c*d^3 + 2*A*a
*b^3*d^4)*g^2*i)*x^3 - ((B*b^4*c^2*d^2 + 4*B*a*b^3*c*d^3 - 5*B*a^2*b^2*d^4)
*g^2*i*n - 12*(2*A*a*b^3*c*d^3 + A*a^2*b^2*d^4)*g^2*i)*x^2 + 2*(12*A*a^2*b^
2*c*d^3*g^2*i + (B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 2*B*a^2*b^2*c*d^3 + B*a^
3*b*d^4)*g^2*i*n)*x + 2*(3*B*b^4*d^4*g^2*i*x^4 + 12*B*a^2*b^2*c*d^3*g^2*i*x
 + 4*(B*b^4*c*d^3 + 2*B*a*b^3*d^4)*g^2*i*x^3 + 6*(2*B*a*b^3*c*d^3 + B*a^2*b
^2*d^4)*g^2*i*x^2)*log(e) + 2*(3*B*b^4*d^4*g^2*i*n*x^4 + 12*B*a^2*b^2*c*d^3
*g^2*i*n*x + 4*(B*b^4*c*d^3 + 2*B*a*b^3*d^4)*g^2*i*n*x^3 + 6*(2*B*a*b^3*c*d
^3 + B*a^2*b^2*d^4)*g^2*i*n*x^2)*log((b*x + a)/(d*x + c)))/(b^2*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="giac")
```

```
[Out] Timed out
```

3.110 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=149

$$\frac{gi(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{6b^2}+\frac{gi(a+bx)^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b}+\frac{Bgin(bc-ad)^3\log}{6b^2d^2}$$

```
[Out] -(B*(b*c - a*d)^2*g*i*n*x)/(6*b*d) + (g*i*(a + b*x)^2*(c + d*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(3*b) + ((b*c - a*d)*g*i*(a + b*x)^2*(A - B*n
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^2) + (B*(b*c - a*d)^3*g*i*n*Log[c
 + d*x])/(6*b^2*d^2)
```

Rubi [B] time = 0.370136, antiderivative size = 311, normalized size of antiderivative = 2.09, number of steps used = 13, number of rules used = 6, integrand size = 39, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2528, 2486, 31, 2525, 12, 72}

$$-\frac{1}{3}bBdginx\left(\frac{a^2}{b^2}-\frac{c^2}{d^2}\right)-\frac{a^2Bgin(ad+bc)\log(a+bx)}{2b^2}+\frac{a^3Bdgin\log(a+bx)}{3b^2}+\frac{1}{3}bdgix^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] a*A*c*g*i*x - (b*B*(a^2/b^2 - c^2/d^2)*d*g*i*n*x)/3 - (B*(b*c - a*d)*(b*c +
 a*d)*g*i*n*x)/(2*b*d) - (B*(b*c - a*d)*g*i*n*x^2)/6 + (a^3*B*d*g*i*n*Log[a
 + b*x])/(3*b^2) - (a^2*B*(b*c + a*d)*g*i*n*Log[a + b*x])/(2*b^2) + (a*B*c*
g*i*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b + ((b*c + a*d)*g*i*x^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/2 + (b*d*g*i*x^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/3 - (b*B*c^3*g*i*n*Log[c + d*x])/(3*d^2) - (a*B*c*(b*c -
a*d)*g*i*n*Log[c + d*x])/(b*d) + (B*c^2*(b*c + a*d)*g*i*n*Log[c + d*x])/(2*
d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (110c+110dx)(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int \left(110acg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+110(bc+ad)gx\left(A\right.\right.$$

$$= (110acg)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx+(110bdg)\int x^2\left(\right.$$

$$= 110aAcgx+55(bc+ad)gx^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)+\frac{11}{3}$$

$$= 110aAcgx+\frac{110aBcg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}+55(bc+ad)$$

$$= 110aAcgx+\frac{110aBcg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}+55(bc+ad)$$

$$= 110aAcgx-\frac{55B(bc-ad)(bc+ad)gnx}{3bd}-\frac{55}{3}B(bc-ad)gnx^2$$

Mathematica [A] time = 0.268147, size = 189, normalized size = 1.27

$$\frac{gi\left(b\left(dx\left(a^2Bd^2n+abd(6Ac+3Adx+Bdnx)+Ab^2dx(3c+2dx)+b^2(-B)cn(c+dx)\right)+Bcn\left(6a^2d^2-3abcd+b^2c^2\right)\log\right.\right.}{6b^2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
),x]
```

```
[Out] (g*i*(-(a^2*B*d^2*(3*b*c + a*d)*n*Log[a + b*x]) + b*(d*x*(a^2*B*d^2*n - b^2
*B*c*n*(c + d*x) + A*b^2*d*x*(3*c + 2*d*x) + a*b*d*(6*A*c + 3*A*d*x + B*d*n
*x)) + B*d^2*(6*a^2*c + 3*a*b*x*(2*c + d*x) + b^2*x^2*(3*c + 2*d*x))*Log[e*
((a + b*x)/(c + d*x))^n] + B*c*(b^2*c^2 - 3*a*b*c*d + 6*a^2*d^2)*n*Log[c +
d*x])))/(6*b^2*d^2)
```

Maple [F] time = 0.35, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)\left(dix+ci\right)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.68457, size = 531, normalized size = 3.56

$$\frac{1}{3}Bbdgix^{3}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{3}Abdgix^{3}+\frac{1}{2}Bbcgix^{2}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{2}Badgix^{2}\log\left(e\left(\frac{bx}{dx+c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algor
ithm="maxima")
```

```
[Out] 1/3*B*b*d*g*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*b*d*g*i*x^
3 + 1/2*B*b*c*g*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*B*a*d*g*
i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*b*c*g*i*x^2 + 1/2*A*a*
d*g*i*x^2 + 1/6*B*b*d*g*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/2*B*
b*c*g*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d
)) - 1/2*B*a*d*g*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c -
a*d)*x/(b*d)) + B*a*c*g*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*a*c*g
*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*c*g*i*x
```

Fricas [B] time = 0.589842, size = 666, normalized size = 4.47

$$\frac{2\,Ab^{3}d^{3}gix^{3}+\left(3\,Ba^{2}bcd^{2}-Ba^{3}d^{3}\right)gin\log\left(bx+a\right)+\left(Bb^{3}c^{3}-3\,Bab^{2}c^{2}d\right)gin\log\left(dx+c\right)-\left(\left(Bb^{3}cd^{2}-Bab^{2}d^{3}\right)gin-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algor
ithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g*i*x^3 + (3*B*a^2*b*c*d^2 - B*a^3*d^3)*g*i*n*log(b*x + a)
 + (B*b^3*c^3 - 3*B*a*b^2*c^2*d)*g*i*n*log(d*x + c) - ((B*b^3*c*d^2 - B*a*b
^2*d^3)*g*i*n - 3*(A*b^3*c*d^2 + A*a*b^2*d^3)*g*i)*x^2 + (6*A*a*b^2*c*d^2*g
*i - (B*b^3*c^2*d - B*a^2*b*d^3)*g*i*n)*x + (2*B*b^3*d^3*g*i*x^3 + 6*B*a*b^
2*c*d^2*g*i*x + 3*(B*b^3*c*d^2 + B*a*b^2*d^3)*g*i*x^2)*log(e) + (2*B*b^3*d^
3*g*i*n*x^3 + 6*B*a*b^2*c*d^2*g*i*n*x + 3*(B*b^3*c*d^2 + B*a*b^2*d^3)*g*i*n
*x^2)*log((b*x + a)/(d*x + c)))/(b^2*d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 10.146, size = 329, normalized size = 2.21

$$\frac{1}{3}\left(Abdgi + Bbdgi\right)x^3 - \frac{1}{6}\left(Bbcgin - Badgin - 3\,Abcgi - 3\,Bbcgi - 3\,Aadgi - 3\,Badgi\right)x^2 + \frac{1}{6}\left(2\,Bbdginx^3 + 6\,Bacginx + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algor
ithm="giac")
```

```
[Out] 1/3*(A*b*d*g*i + B*b*d*g*i)*x^3 - 1/6*(B*b*c*g*i*n - B*a*d*g*i*n - 3*A*b*c*
g*i - 3*B*b*c*g*i - 3*A*a*d*g*i - 3*B*a*d*g*i)*x^2 + 1/6*(2*B*b*d*g*i*n*x^3
 + 6*B*a*c*g*i*n*x + 3*(B*b*c*g*i*n + B*a*d*g*i*n)*x^2)*log((b*x + a)/(d*x
+ c)) - 1/6*(B*b^2*c^2*g*i*n - B*a^2*d^2*g*i*n - 6*A*a*b*c*d*g*i - 6*B*a*b*
c*d*g*i)*x/(b*d) + 1/6*(B*b*c^3*g*i*n - 3*B*a*c^2*d*g*i*n)*log(d*i*x + c*i)
/d^2 + 1/6*(3*B*a^2*b*c*g*i*n - B*a^3*d*g*i*n)*log(b*x + a)/b^2
```

3.111 $\int (ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=86

$$\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d}-\frac{Bin(bc-ad)^2\log(a+bx)}{2b^2d}-\frac{Binx(bc-ad)}{2b}$$

```
[Out] -(B*(b*c - a*d)*i*n*x)/(2*b) - (B*(b*c - a*d)^2*i*n*Log[a + b*x])/(2*b^2*d)
 + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)
```

Rubi [A] time = 0.0608629, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {2525, 12, 43}

$$\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d}-\frac{Bin(bc-ad)^2\log(a+bx)}{2b^2d}-\frac{Binx(bc-ad)}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)*i*n*x)/(2*b) - (B*(b*c - a*d)^2*i*n*Log[a + b*x])/(2*b^2*d)
 + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (111c+111dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{111(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d} - \frac{(Bn)\int \frac{12321(bc-ad)(c+dx)}{a+bx}dx}{222d}$$
$$= \frac{111(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d} - \frac{(111B(bc-ad)n)\int \frac{c+dx}{a+bx}dx}{2d}$$
$$= \frac{111(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d} - \frac{(111B(bc-ad)n)\int \left(\frac{d}{b}+\frac{bc-ad}{b(a+bx)}\right.}{2d}$$
$$= -\frac{111B(bc-ad)nx}{2b} - \frac{111B(bc-ad)^2 n\log(a+bx)}{2b^2 d} + \frac{111(c+dx)^2\left(A+\right.}{2}$$

Mathematica [A] time = 0.0388606, size = 74, normalized size = 0.86

$$\frac{i\left((c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)((bc-ad)\log(a+bx)+bdx)}{b^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (i*(-((B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*x]))/b^2) + (c + d*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(2*d)
```

Maple [F] time = 0.371, size = 0, normalized size = 0.

$$\int (dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 1.24362, size = 211, normalized size = 2.45

$$\frac{1}{2}Bdix^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{2}Adix^2-\frac{1}{2}Bdin\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)+Bcin\left(\frac{a\log(bx\right.}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] 1/2*B*d*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*d*i*x^2 - 1/2*
B*d*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))
 + B*c*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*c*i*x*log(e*(b*x/(d*x
```

```
+ c) + a/(d*x + c))^n) + A*c*i*x
```

Fricas [B] time = 0.5185, size = 360, normalized size = 4.19

$$\frac{Ab^2d^2ix^2 - Bb^2c^2in\log(dx+c) + \left(2\,Babcd - Ba^2d^2\right)in\log(bx+a) + \left(2\,Ab^2cdi - \left(Bb^2cd - Babd^2\right)in\right)x + \left(Bb^2d^2ix^2 + \right.}{2\,b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] 1/2*(A*b^2*d^2*i*x^2 - B*b^2*c^2*i*n*log(d*x + c) + (2*B*a*b*c*d - B*a^2*d^
2)*i*n*log(b*x + a) + (2*A*b^2*c*d*i - (B*b^2*c*d - B*a*b*d^2)*i*n)*x + (B*
b^2*d^2*i*x^2 + 2*B*b^2*c*d*i*x)*log(e) + (B*b^2*d^2*i*n*x^2 + 2*B*b^2*c*d*
i*n*x)*log((b*x + a)/(d*x + c)))/(b^2*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.47673, size = 339, normalized size = 3.94

$$\frac{1}{2}\,(Adi + Bdi)x^2 + \frac{1}{2}\left(Bdinx^2 + 2\,Bcinx\right)\log\left(\frac{bx+a}{dx+c}\right) - \frac{(Bbcin - Badin - 2\,Abci - 2\,Bbci)x}{2\,b} - \frac{\left(Bb^2c^2in - 2\,Babcdin + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] 1/2*(A*d*i + B*d*i)*x^2 + 1/2*(B*d*i*n*x^2 + 2*B*c*i*n*x)*log((b*x + a)/(d*
x + c)) - 1/2*(B*b*c*i*n - B*a*d*i*n - 2*A*b*c*i - 2*B*b*c*i)*x/b - 1/4*(B*
b^2*c^2*i*n - 2*B*a*b*c*d*i*n + B*a^2*d^2*i*n)*log(abs(b*d*x^2 + b*c*x + a*
d*x + a*c))/(b^2*d) + 1/4*(B*b^3*c^3*i*n + B*a*b^2*c^2*d*i*n - 3*B*a^2*b*c*
d^2*i*n + B*a^3*d^3*i*n)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2
*b*d*x + b*c + a*d + abs(-b*c + a*d))))/(b^2*d*abs(-b*c + a*d))
```

3.112 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=141

$$\frac{Bin(bc-ad)\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b^2g}-\frac{i(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A-Bn\right)}{b^2g}+\frac{i(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{bg}$$

```
[Out] (i*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b*g) - ((b*c - a*d)*i
*Log[-((b*c - a*d)/(d*(a + b*x)))]*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(b^2*g) + (B*(b*c - a*d)*i*n*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))
])/(b^2*g)
```

Rubi [A] time = 0.344796, antiderivative size = 223, normalized size of antiderivative = 1.58, number of steps used = 13, number of rules used = 10, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.244, Rules used = {2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bin(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}+\frac{i(bc-ad)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g}+\frac{Bdi(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}-\frac{Bin}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x),x]
```

```
[Out] (A*d*i*x)/(b*g) - (B*(b*c - a*d)*i*n*Log[a + b*x]^2)/(2*b^2*g) + (B*d*i*(a
+ b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^2*g) + ((b*c - a*d)*i*Log[a + b*x
]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g) - (B*(b*c - a*d)*i*n*Log[
c + d*x])/(b^2*g) + (B*(b*c - a*d)*i*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
- a*d)])/(b^2*g) + (B*(b*c - a*d)*i*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/(b^2*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(112c+112dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}dx = \int \left(\frac{112d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg} + \frac{112(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg(a+bx)}\right.$$

$$= \frac{(112d)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{bg} + \frac{(112(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}}{bg}$$

$$= \frac{112Adx}{bg} + \frac{112(bc-ad)\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g} + \frac{(112Bd)\int}{}$$

$$= \frac{112Adx}{bg} + \frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g} + \frac{112(bc-ad)\log(a+bx)\left(A\right.}{b^2g}$$

$$= \frac{112Adx}{bg} + \frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g} + \frac{112(bc-ad)\log(a+bx)\left(A\right.}{b^2g}$$

$$= \frac{112Adx}{bg} + \frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g} + \frac{112(bc-ad)\log(a+bx)\left(A\right.}{b^2g}$$

$$= \frac{112Adx}{bg} - \frac{56B(bc-ad)n\log^2(a+bx)}{b^2g} + \frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}$$

$$= \frac{112Adx}{bg} - \frac{56B(bc-ad)n\log^2(a+bx)}{b^2g} + \frac{112Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}$$

Mathematica [A] time = 0.123463, size = 172, normalized size = 1.22

$$\frac{i\left(2Bn(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2(bc-ad)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)+2\left(Bd(a+bx)\log\right.\right.}{2b^2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x),x]
```

```
[Out] (i*(B*(-(b*c) + a*d)*n*Log[a + b*x]^2 + 2*(A*b*d*x + B*d*(a + b*x)*Log[e*((
a + b*x)/(c + d*x))^n] + B*(-(b*c) + a*d)*n*Log[c + d*x]) + 2*(b*c - a*d)*L
og[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(b*(c + d*x))/(
b*c - a*d)]) + 2*B*(b*c - a*d)*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
/(2*b^2*g)
```

Maple [F] time = 0.619, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

Maxima [A] time = 2.89133, size = 373, normalized size = 2.65

$$Adi\left(\frac{x}{bg} - \frac{a\log(bx+a)}{b^2g}\right) - \frac{Bcin\log(dx+c)}{bg} + \frac{Aci\log(bgx+ag)}{bg} + \frac{(bcin-adin)\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right) + \mathrm{Li}\right.}{b^2g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algor
ithm="maxima")
```

```
[Out] A*d*i*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - B*c*i*n*log(d*x + c)/(b*g) + A*c
*i*log(b*g*x + a*g)/(b*g) + (b*c*i*n - a*d*i*n)*(log(b*x + a)*log((b*d*x +
a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^2*g) + 1/2*
(2*B*b*d*i*x*log(e) - (b*c*i*n - a*d*i*n)*B*log(b*x + a)^2 + 2*(b*c*i*log(e
) + (i*n - i*log(e))*a*d)*B*log(b*x + a) + 2*(B*b*d*i*x + (b*c*i - a*d*i)*B
*log(b*x + a))*log((b*x + a)^n) - 2*(B*b*d*i*x + (b*c*i - a*d*i)*B*log(b*x
+ a))*log((d*x + c)^n))/(b^2*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Adix + Aci + (Bdix + Bci)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{bgx + ag}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algor
ithm="fricas")
```

```
[Out] integral((A*d*i*x + A*c*i + (B*d*i*x + B*c*i)*log(e*((b*x + a)/(d*x + c))^n
))/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{bgx + ag}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a*g
), x)
```

3.113 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=150

$$\frac{BdinPolyLog\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}-\frac{di\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2}-\frac{i(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg^2(a+bx)}-\frac{Bin(c+}{bg^2(a+}$$

```
[Out] -((B*i*n*(c + d*x))/(b*g^2*(a + b*x))) - (i*(c + d*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (B*d*i*n*PolyLog[
2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2)
```

Rubi [A] time = 0.375878, antiderivative size = 233, normalized size of antiderivative = 1.55, number of steps used = 14, number of rules used = 11, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.268, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{BdinPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2}+\frac{di\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2}-\frac{i(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2(a+bx)}-\frac{Bin(bc-}{b^2g^2(a+}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^2,
x]
```

```
[Out] -((B*(b*c - a*d)*i*n)/(b^2*g^2*(a + b*x))) - (B*d*i*n*Log[a + b*x])/(b^2*g^
2) - (B*d*i*n*Log[a + b*x]^2)/(2*b^2*g^2) - ((b*c - a*d)*i*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(b^2*g^2*(a + b*x)) + (d*i*Log[a + b*x]*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2) + (B*d*i*n*Log[c + d*x])/(b^2*g^2) +
 (B*d*i*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) + (B*d*i*n
*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(113c+113dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}dx = \int \left(\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^2(a+bx)^2} + \frac{113d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{bg^2(a+bx)}\right.$$

$$= \frac{(113d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{bg^2} + \frac{(113(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}dx}{bg^2}$$

$$= -\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)} + \frac{113d\log(a+bx)\left(A+B\log\right.}{b^2g^2}$$

$$= -\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)} + \frac{113d\log(a+bx)\left(A+B\log\right.}{b^2g^2}$$

$$= -\frac{113(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)} + \frac{113d\log(a+bx)\left(A+B\log\right.}{b^2g^2}$$

$$= -\frac{113B(bc-ad)n}{b^2g^2(a+bx)} - \frac{113Bdn\log(a+bx)}{b^2g^2} - \frac{113(bc-ad)\left(A+B\log\left(e\right.\right.}{b^2g^2(a+bx)}$$

$$= -\frac{113B(bc-ad)n}{b^2g^2(a+bx)} - \frac{113Bdn\log(a+bx)}{b^2g^2} - \frac{113Bdn\log^2(a+bx)}{2b^2g^2} - \frac{113}{}$$

$$= -\frac{113B(bc-ad)n}{b^2g^2(a+bx)} - \frac{113Bdn\log(a+bx)}{b^2g^2} - \frac{113Bdn\log^2(a+bx)}{2b^2g^2} - \frac{113}{}$$

Mathematica [A] time = 0.173961, size = 189, normalized size = 1.26

$$\frac{i\left(-\frac{Bdn\left(-2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)-2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)+\log^2(a+bx)\right)}{2b^2} + \frac{d\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2} - \frac{(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2(a+bx)} - \frac{Bn(\ldots}{}\right.}{g^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^2,x]
```

```
[Out] (i*(-(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*(a + b*x)))
 + (d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/b^2 - (B*n*((b*c
 - a*d)/(a + b*x) + d*Log[a + b*x] - d*Log[c + d*x]))/b^2 - (B*d*n*(Log[a +
 b*x]^2 - 2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))]))/(2*b^2)))/g^2
```

Maple [F] time = 0.523, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{(bgx+ag)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-Bcin\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log(bx+a)}{(b^2c-abd)g^2}-\frac{d\log(dx+c)}{(b^2c-abd)g^2}\right)+Bdi\left(\frac{((bx+a)\log(bx+a)+a)\log\left((bx+a)^n\right)-((bx+a)\log(}{b^3g^2x+ab^2g^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, alg
orithm="maxima")
```

```
[Out] -B*c*i*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) -
d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + B*d*i*((((b*x + a)*log(b*x + a) + a
)*log((b*x + a)^n) - ((b*x + a)*log(b*x + a) + a)*log((d*x + c)^n))/(b^3*g^
2*x + a*b^2*g^2) + integrate((b^2*d*x^2*log(e) + b^2*c*x*log(e) - a*b*c*n +
 a^2*d*n - (a*b*c*n - a^2*d*n + (b^2*c*n - a*b*d*n)*x)*log(b*x + a))/(b^4*d
*g^2*x^3 + a^2*b^2*c*g^2 + (b^4*c*g^2 + 2*a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2
 + a^2*b^2*d*g^2)*x), x)) + A*d*i*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)
/(b^2*g^2)) - B*c*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^2*g^2*x + a*b
*g^2) - A*c*i/(b^2*g^2*x + a*b*g^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Adix+Aci+(Bdix+Bci)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^2g^2x^2+2\,abg^2x+a^2g^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, alg
orithm="fricas")
```

```
[Out] integral((A*d*i*x + A*c*i + (B*d*i*x + B*c*i)*log(e*((b*x + a)/(d*x + c))^n
))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a*g
)^2, x)
```

3.114 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=89

$$-\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3(a+bx)^2(bc-ad)}-\frac{Bin(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

```
[Out] -(B*i*n*(c + d*x)^2)/(4*(b*c - a*d)*g^3*(a + b*x)^2) - (i*(c + d*x)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*g^3*(a + b*x)^2)
```

Rubi [B] time = 0.285895, antiderivative size = 201, normalized size of antiderivative = 2.26, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 44}

$$-\frac{di\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^3(a+bx)}-\frac{i(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^3(a+bx)^2}-\frac{Bd^2in\log(a+bx)}{2b^2g^3(bc-ad)}+\frac{Bd^2in\log(c+dx)}{2b^2g^3(bc-ad)}-\frac{Bin(bc-a}{4b^2g^3(a+b}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^3,
x]
```

```
[Out] -(B*(b*c - a*d)*i*n)/(4*b^2*g^3*(a + b*x)^2) - (B*d*i*n)/(2*b^2*g^3*(a + b*
x)) - (B*d^2*i*n*Log[a + b*x])/(2*b^2*(b*c - a*d)*g^3) - ((b*c - a*d)*i*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^3*(a + b*x)^2) - (d*i*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^3*(a + b*x)) + (B*d^2*i*n*Log[c + d
*x])/(2*b^2*(b*c - a*d)*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(114c+114dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}dx = \int \left(\frac{114(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^3(a+bx)^3} + \frac{114d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{bg^3(a+bx)^2}\right.$$

$$= \frac{(114d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}dx}{bg^3} + \frac{(114(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3}dx}{bg^3}$$

$$= -\frac{57(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^2} - \frac{114d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)}$$

$$= -\frac{57(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^2} - \frac{114d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)}$$

$$= -\frac{57(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^2} - \frac{114d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)}$$

$$= -\frac{57B(bc-ad)n}{2b^2g^3(a+bx)^2} - \frac{57Bdn}{b^2g^3(a+bx)} - \frac{57Bd^2n\log(a+bx)}{b^2(bc-ad)g^3} - \frac{57(bc-ad)}{}$$

Mathematica [B] time = 0.161494, size = 216, normalized size = 2.43

$$\frac{i\left(-\frac{d\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2(a+bx)} - \frac{(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2(a+bx)^2} - \frac{Bn\left(-\frac{2d^2\log(a+bx)}{bc-ad}+\frac{2d^2\log(c+dx)}{bc-ad}+\frac{bc-ad}{(a+bx)^2}-\frac{2d}{a+bx}\right)}{4b^2} - \frac{Bdn\left(\frac{d\log(a+bx)}{bc-ad}-\frac{d\log(c+dx)}{bc-ad}+\frac{1}{a+bx}\right)}{b^2}\right)}{g^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^3,x]
```

```
[Out] (i*(-((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*(a + b*x)^
2) - (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*(a + b*x)) - (B*d*n*((
a + b*x)^(-1) + (d*Log[a + b*x])/(b*c - a*d) - (d*Log[c + d*x])/(b*c - a*d)
))/b^2 - (B*n*((b*c - a*d)/(a + b*x)^2 - (2*d)/(a + b*x) - (2*d^2*Log[a + b
*x])/(b*c - a*d) + (2*d^2*Log[c + d*x])/(b*c - a*d)))/(4*b^2)))/g^3
```

Maple [F] time = 0.514, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{(bgx+ag)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

Maxima [B] time = 1.29162, size = 786, normalized size = 8.83

$$-\frac{1}{4}\,Bdin\left(\frac{3\,abc-a^{2}d+2\left(2\,b^{2}c-abd\right)x}{\left(b^{5}c-ab^{4}d\right)g^{3}x^{2}+2\left(ab^{4}c-a^{2}b^{3}d\right)g^{3}x+\left(a^{2}b^{3}c-a^{3}b^{2}d\right)g^{3}}+\frac{2\left(2\,bcd-ad^{2}\right)\log\left(bx+a\right)}{\left(b^{4}c^{2}-2\,ab^{3}cd+a^{2}b^{2}d^{2}\right)g^{3}}-\frac{2\left(2\,bcd-ad^{2}\right)\mathrm{l}}{\left(b^{4}c^{2}-2\,ab^{3}cd+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, alg
orithm="maxima")
```

```
[Out] -1/4*B*d*i*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*
g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*
(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)
- 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g
^3)) + 1/4*B*c*i*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*
(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x +
a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2
 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*(2*b*x + a)*B*d*i*log(e*(b*x/(d*x +
 c) + a/(d*x + c))^n)/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*(2*
b*x + a)*A*d*i/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*B*c*i*log(
e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3
) - 1/2*A*c*i/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] time = 0.509721, size = 510, normalized size = 5.73

$$-\frac{\left(Bb^{2}c^{2}-Ba^{2}d^{2}\right)in+2\left(Ab^{2}c^{2}-Aa^{2}d^{2}\right)i+2\left(\left(Bb^{2}cd-Babd^{2}\right)in+2\left(Ab^{2}cd-Aabd^{2}\right)i\right)x+2\left(2\left(Bb^{2}cd-Babd^{2}\right)ix+\left(\right.\right.}{4\left(\left(b^{5}c-ab^{4}d\right)g^{3}x^{2}+2\left(ab^{4}c-a^{2}b^{3}d\right)g^{3}x+\left(a^{2}b^{3}c-\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, alg
orithm="fricas")
```

```
[Out] -1/4*((B*b^2*c^2 - B*a^2*d^2)*i*n + 2*(A*b^2*c^2 - A*a^2*d^2)*i + 2*((B*b^2
*c*d - B*a*b*d^2)*i*n + 2*(A*b^2*c*d - A*a*b*d^2)*i)*x + 2*(2*(B*b^2*c*d -
B*a*b*d^2)*i*x + (B*b^2*c^2 - B*a^2*d^2)*i)*log(e) + 2*(B*b^2*d^2*i*n*x^2 +
 2*B*b^2*c*d*i*n*x + B*b^2*c^2*i*n)*log((b*x + a)/(d*x + c)))/((b^5*c - a*b
^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.23785, size = 320, normalized size = 3.6

$$\frac{Bd^2n\log(bx+a)}{2\left(b^3cg^3i-ab^2dg^3i\right)}-\frac{Bd^2n\log(dx+c)}{2\left(b^3cg^3i-ab^2dg^3i\right)}-\frac{(2\,Bbdinx+Bbcin+Badin)\log\left(\frac{bx+a}{dx+c}\right)}{2\left(b^4g^3x^2+2\,ab^3g^3x+a^2b^2g^3\right)}-\frac{2\,Bbdinx+Bbcin+Badin+}{4(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, alg
orithm="giac")
```

```
[Out] 1/2*B*d^2*n*log(b*x + a)/(b^3*c*g^3*i - a*b^2*d*g^3*i) - 1/2*B*d^2*n*log(d*
x + c)/(b^3*c*g^3*i - a*b^2*d*g^3*i) - 1/2*(2*B*b*d*i*n*x + B*b*c*i*n + B*a
*d*i*n)*log((b*x + a)/(d*x + c))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3
) - 1/4*(2*B*b*d*i*n*x + B*b*c*i*n + B*a*d*i*n + 4*A*b*d*i*x + 4*B*b*d*i*x
+ 2*A*b*c*i + 2*B*b*c*i + 2*A*a*d*i + 2*B*a*d*i)/(b^4*g^3*x^2 + 2*a*b^3*g^3
*x + a^2*b^2*g^3)
```

3.115 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=181

$$-\frac{bi(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4(a+bx)^3(bc-ad)^2}+\frac{di(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4(a+bx)^2(bc-ad)^2}-\frac{bBin(c+dx)^3}{9g^4(a+bx)^3(bc-ad)^2}+\frac{Bdin(c+dx)}{4g^4(a+bx)^2(bc-}$$

```
[Out] (B*d*i*n*(c + d*x)^2)/(4*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*B*i*n*(c + d*x
)^3)/(9*(b*c - a*d)^2*g^4*(a + b*x)^3) + (d*i*(c + d*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*i*(c + d*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Rubi [A] time = 0.340598, antiderivative size = 236, normalized size of antiderivative = 1.3, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 44}

$$-\frac{di\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^4(a+bx)^2}-\frac{i(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^2g^4(a+bx)^3}+\frac{Bd^2in}{6b^2g^4(a+bx)(bc-ad)}+\frac{Bd^3in\log(a+bx)}{6b^2g^4(bc-ad)^2}-\frac{Bd^3in}{6b^2g^4}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^4,
x]
```

```
[Out] -(B*(b*c - a*d)*i*n)/(9*b^2*g^4*(a + b*x)^3) - (B*d*i*n)/(12*b^2*g^4*(a + b
*x)^2) + (B*d^2*i*n)/(6*b^2*(b*c - a*d)*g^4*(a + b*x)) + (B*d^3*i*n*Log[a +
 b*x])/(6*b^2*(b*c - a*d)^2*g^4) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(3*b^2*g^4*(a + b*x)^3) - (d*i*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(2*b^2*g^4*(a + b*x)^2) - (B*d^3*i*n*Log[c + d*x])/(6*b^2*(b*c -
 a*d)^2*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(115c+115dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx = \int \left(\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^4(a+bx)^4}+\frac{115d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^4(a+bx)^3}\right.$$

$$=\frac{(115d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3}\,dx}{bg^4}+\frac{(115(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4}\,dx}{bg^4}$$

$$=-\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^4(a+bx)^3}-\frac{115d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^4(a+bx)^2}$$

$$=-\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^4(a+bx)^3}-\frac{115d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^4(a+bx)^2}$$

$$=-\frac{115(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^4(a+bx)^3}-\frac{115d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^4(a+bx)^2}$$

$$=-\frac{115B(bc-ad)n}{9b^2g^4(a+bx)^3}-\frac{115Bdn}{12b^2g^4(a+bx)^2}+\frac{115Bd^2n}{6b^2(bc-ad)g^4(a+bx)}+\frac{115I}{6l}$$

Mathematica [A] time = 0.460613, size = 196, normalized size = 1.08

$$-\frac{i\left(\frac{12Abc}{(a+bx)^3}+\frac{18Ad}{(a+bx)^2}-\frac{12aAd}{(a+bx)^3}-\frac{6Bd^2n}{(a+bx)(bc-ad)}-\frac{6Bd^3n\log(a+bx)}{(bc-ad)^2}+\frac{6Bd^3n\log(c+dx)}{(bc-ad)^2}+\frac{6B(ad+2bc+3bdx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3}+\frac{4bBcn}{(a+bx)^3}+\frac{3B}{(a+l}\right.}{36b^2g^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^4,x]
```

```
[Out] -(i*((12*A*b*c)/(a + b*x)^3 - (12*a*A*d)/(a + b*x)^3 + (4*b*B*c*n)/(a + b*x
)^3 - (4*a*B*d*n)/(a + b*x)^3 + (18*A*d)/(a + b*x)^2 + (3*B*d*n)/(a + b*x)^
2 - (6*B*d^2*n)/((b*c - a*d)*(a + b*x)) - (6*B*d^3*n*Log[a + b*x])/(b*c - a
*d)^2 + (6*B*(2*b*c + a*d + 3*b*d*x)*Log[e*((a + b*x)/(c + d*x))^n])/(a + b
*x)^3 + (6*B*d^3*n*Log[c + d*x])/(b*c - a*d)^2))/(36*b^2*g^4)
```

Maple [F] time = 0.531, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{(bgx+ag)^4}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

Maxima [B] time = 1.49898, size = 1276, normalized size = 7.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, alg
orithm="maxima")
```

```
[Out] -1/18*B*c*i*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2
*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*
b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3
*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4)
+ 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^
3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
a^3*b*d^3)*g^4)) - 1/36*B*d*i*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 -
6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*
x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^
5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2
)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 -
 a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*
d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d +
3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/6*(3*b*x + a)*B*d*i*log(e*(b*x/(d*
x + c) + a/(d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x +
 a^3*b^2*g^4) - 1/6*(3*b*x + a)*A*d*i/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^
2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*B*c*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A*c*
i/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 0.559639, size = 988, normalized size = 5.46

$$\frac{6\left(Bb^3cd^2 - Bab^2d^3\right)inx^2 - \left(4\,Bb^3c^3 - 9\,Bab^2c^2d + 5\,Ba^3d^3\right)in - 6\left(2\,Ab^3c^3 - 3\,Aab^2c^2d + Aa^3d^3\right)i - 3\left(\left(Bb^3c^2d - 6\,Bab^2 \cdots\right.\right.}{36\left(\left(b^7c^2 - \cdots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, alg
orithm="fricas")
```

```
[Out] 1/36*(6*(B*b^3*c*d^2 - B*a*b^2*d^3)*i*n*x^2 - (4*B*b^3*c^3 - 9*B*a*b^2*c^2*
d + 5*B*a^3*d^3)*i*n - 6*(2*A*b^3*c^3 - 3*A*a*b^2*c^2*d + A*a^3*d^3)*i - 3*
((B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*i*n + 6*(A*b^3*c^2*d - 2*A
*a*b^2*c*d^2 + A*a^2*b*d^3)*i)*x - 6*(3*(B*b^3*c^2*d - 2*B*a*b^2*c*d^2 + B*
a^2*b*d^3)*i*x + (2*B*b^3*c^3 - 3*B*a*b^2*c^2*d + B*a^3*d^3)*i)*log(e) + 6*
(B*b^3*d^3*i*n*x^3 + 3*B*a*b^2*d^3*i*n*x^2 - 3*(B*b^3*c^2*d - 2*B*a*b^2*c*d
^2)*i*n*x - (2*B*b^3*c^3 - 3*B*a*b^2*c^2*d)*i*n)*log((b*x + a)/(d*x + c)))/
((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c
```

```
*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g
^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.27089, size = 624, normalized size = 3.45

$$-\frac{Bd^3n\log\left(bx+a\right)}{6\left(b^4c^2g^4i-2\,ab^3cdg^4i+a^2b^2d^2g^4i\right)}+\frac{Bd^3n\log\left(dx+c\right)}{6\left(b^4c^2g^4i-2\,ab^3cdg^4i+a^2b^2d^2g^4i\right)}-\frac{\left(3\,Bbdinx+2\,Bbcin+Badin\right)\log\left(\cdots\right.}{6\left(b^5g^4x^3+3\,ab^4g^4x^2+3\,a^2b^3g^4x+\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, alg
orithm="giac")
```

```
[Out] -1/6*B*d^3*n*log(b*x + a)/(b^4*c^2*g^4*i - 2*a*b^3*c*d*g^4*i + a^2*b^2*d^2*
g^4*i) + 1/6*B*d^3*n*log(d*x + c)/(b^4*c^2*g^4*i - 2*a*b^3*c*d*g^4*i + a^2*
b^2*d^2*g^4*i) - 1/6*(3*B*b*d*i*n*x + 2*B*b*c*i*n + B*a*d*i*n)*log((b*x + a
)/(d*x + c))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4
) + 1/36*(6*B*b^2*d^2*i*n*x^2 - 3*B*b^2*c*d*i*n*x + 15*B*a*b*d^2*i*n*x - 4*
B*b^2*c^2*i*n + 5*B*a*b*c*d*i*n + 5*B*a^2*d^2*i*n - 18*A*b^2*c*d*i*x - 18*B
*b^2*c*d*i*x + 18*A*a*b*d^2*i*x + 18*B*a*b*d^2*i*x - 12*A*b^2*c^2*i - 12*B*
b^2*c^2*i + 6*A*a*b*c*d*i + 6*B*a*b*c*d*i + 6*A*a^2*d^2*i + 6*B*a^2*d^2*i)/
(b^6*c*g^4*x^3 - a*b^5*d*g^4*x^3 + 3*a*b^5*c*g^4*x^2 - 3*a^2*b^4*d*g^4*x^2
+ 3*a^2*b^4*c*g^4*x - 3*a^3*b^3*d*g^4*x + a^3*b^3*c*g^4 - a^4*b^2*d*g^4)
```

3.116 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=281

$$-\frac{b^2i(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^5(a+bx)^2(bc-ad)^3}+\frac{2bdi(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^3}-$$

```
[Out] -(B*d^2*i*n*(c + d*x)^2)/(4*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*B*d*i*n*(
c + d*x)^3)/(9*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*B*i*n*(c + d*x)^4)/(16
*(b*c - a*d)^3*g^5*(a + b*x)^4) - (d^2*i*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*d*i*(c + d*x)^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3*g^5*(a + b*x)^3) -
 (b^2*i*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*(b*c - a*d)^
3*g^5*(a + b*x)^4)
```

Rubi [A] time = 0.409461, antiderivative size = 269, normalized size of antiderivative = 0.96, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 44}

$$-\frac{di\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^2g^5(a+bx)^3}-\frac{i(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b^2g^5(a+bx)^4}-\frac{Bd^3in}{12b^2g^5(a+bx)(bc-ad)^2}+\frac{Bd^2in}{24b^2g^5(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^5,
x]
```

```
[Out] -(B*(b*c - a*d)*i*n)/(16*b^2*g^5*(a + b*x)^4) - (B*d*i*n)/(36*b^2*g^5*(a +
b*x)^3) + (B*d^2*i*n)/(24*b^2*(b*c - a*d)*g^5*(a + b*x)^2) - (B*d^3*i*n)/(1
2*b^2*(b*c - a*d)^2*g^5*(a + b*x)) - (B*d^4*i*n*Log[a + b*x])/(12*b^2*(b*c
- a*d)^3*g^5) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b
^2*g^5*(a + b*x)^4) - (d*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*g
^5*(a + b*x)^3) + (B*d^4*i*n*Log[c + d*x])/(12*b^2*(b*c - a*d)^3*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(116c+116dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}dx = \int \left(\frac{116(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^5(a+bx)^5}+\frac{116d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^5(a+bx)^4}\right.$$

$$= \frac{(116d)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4}dx}{bg^5}+\frac{(116(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^5}dx}{bg^5}$$

$$= -\frac{29(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^4}-\frac{116d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^5(a+bx)^3}$$

$$= -\frac{29(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^4}-\frac{116d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^5(a+bx)^3}$$

$$= -\frac{29(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^4}-\frac{116d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^2g^5(a+bx)^3}$$

$$= -\frac{29B(bc-ad)n}{4b^2g^5(a+bx)^4}-\frac{29Bdn}{9b^2g^5(a+bx)^3}+\frac{29Bd^2n}{6b^2(bc-ad)g^5(a+bx)^2}-\frac{}{3b^2(}$$

Mathematica [A] time = 0.530503, size = 220, normalized size = 0.78

$$-\frac{i\left(\frac{36Abc}{(a+bx)^4}+\frac{48Ad}{(a+bx)^3}-\frac{36aAd}{(a+bx)^4}+\frac{12Bd^3n}{(a+bx)(bc-ad)^2}-\frac{6Bd^2n}{(a+bx)^2(bc-ad)}+\frac{12Bd^4n\log(a+bx)}{(bc-ad)^3}-\frac{12Bd^4n\log(c+dx)}{(bc-ad)^3}+\frac{12B(ad+3bc+4bdx)\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.}{(a+bx)^4}\right.}{144b^2g^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g
*x)^5,x]
```

```
[Out] -(i*((36*A*b*c)/(a + b*x)^4 - (36*a*A*d)/(a + b*x)^4 + (9*b*B*c*n)/(a + b*x
)^4 - (9*a*B*d*n)/(a + b*x)^4 + (48*A*d)/(a + b*x)^3 + (4*B*d*n)/(a + b*x)^
3 - (6*B*d^2*n)/((b*c - a*d)*(a + b*x)^2) + (12*B*d^3*n)/((b*c - a*d)^2*(a
+ b*x)) + (12*B*d^4*n*Log[a + b*x])/(b*c - a*d)^3 + (12*B*(3*b*c + a*d + 4*
b*d*x)*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^4 - (12*B*d^4*n*Log[c + d*
x])/(b*c - a*d)^3))/(144*b^2*g^5)
```

Maple [F] time = 0.535, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{(bgx+ag)^5}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)

[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)
```

Maxima [B] time = 1.62016, size = 1887, normalized size = 6.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, alg
orithm="maxima")

[Out] 1/48*B*c*i*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2
 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*
d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^
5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4
*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^
3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b
^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^
3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2
 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*
b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/144*
B*d*i*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12
*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^
2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^
3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 +
4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6
*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 +
4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (
a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4
*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^
2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x +
c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^
2*d^4)*g^5)) - 1/12*(4*b*x + a)*B*d*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
)/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^
4*b^2*g^5) - 1/12*(4*b*x + a)*A*d*i/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*
b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/4*B*c*i*log(e*(b*x/(d*x +
c) + a/(d*x + c))^n)/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4
*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A*c*i/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*
a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 0.547895, size = 1574, normalized size = 5.6

$$-\frac{12\left(Bb^4cd^3-Bab^3d^4\right)inx^3-6\left(Bb^4c^2d^2-8\,Bab^3cd^3+7\,Ba^2b^2d^4\right)inx^2+\left(9\,Bb^4c^4-32\,Bab^3c^3d+36\,Ba^2b^2c^2d^2-13\,Ba^4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, alg
orithm="fricas")
```

```
[Out] -1/144*(12*(B*b^4*c*d^3 - B*a*b^3*d^4)*i*n*x^3 - 6*(B*b^4*c^2*d^2 - 8*B*a*b
^3*c*d^3 + 7*B*a^2*b^2*d^4)*i*n*x^2 + (9*B*b^4*c^4 - 32*B*a*b^3*c^3*d + 36*
B*a^2*b^2*c^2*d^2 - 13*B*a^4*d^4)*i*n + 12*(3*A*b^4*c^4 - 8*A*a*b^3*c^3*d +
 6*A*a^2*b^2*c^2*d^2 - A*a^4*d^4)*i + 4*((B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 +
 18*B*a^2*b^2*c*d^3 - 13*B*a^3*b*d^4)*i*n + 12*(A*b^4*c^3*d - 3*A*a*b^3*c^2
*d^2 + 3*A*a^2*b^2*c*d^3 - A*a^3*b*d^4)*i)*x + 12*(4*(B*b^4*c^3*d - 3*B*a*b
^3*c^2*d^2 + 3*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*i*x + (3*B*b^4*c^4 - 8*B*a*b^
3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - B*a^4*d^4)*i)*log(e) + 12*(B*b^4*d^4*i*n*x^
4 + 4*B*a*b^3*d^4*i*n*x^3 + 6*B*a^2*b^2*d^4*i*n*x^2 + 4*(B*b^4*c^3*d - 3*B*
a*b^3*c^2*d^2 + 3*B*a^2*b^2*c*d^3)*i*n*x + (3*B*b^4*c^4 - 8*B*a*b^3*c^3*d +
 6*B*a^2*b^2*c^2*d^2)*i*n)*log((b*x + a)/(d*x + c)))/((b^9*c^3 - 3*a*b^8*c^
2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2
*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^
2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c
^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*
d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.39094, size = 1025, normalized size = 3.65

$$\frac{Bd^4n\log(bx+a)}{12\left(b^5c^3g^5i-3\,ab^4c^2dg^5i+3\,a^2b^3cd^2g^5i-a^3b^2d^3g^5i\right)}-\frac{Bd^4n\log(dx+c)}{12\left(b^5c^3g^5i-3\,ab^4c^2dg^5i+3\,a^2b^3cd^2g^5i-a^3b^2d^3g^5i\right)}-\frac{}{12\left(b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, alg
orithm="giac")
```

```
[Out] 1/12*B*d^4*n*log(b*x + a)/(b^5*c^3*g^5*i - 3*a*b^4*c^2*d*g^5*i + 3*a^2*b^3*
c*d^2*g^5*i - a^3*b^2*d^3*g^5*i) - 1/12*B*d^4*n*log(d*x + c)/(b^5*c^3*g^5*i
 - 3*a*b^4*c^2*d*g^5*i + 3*a^2*b^3*c*d^2*g^5*i - a^3*b^2*d^3*g^5*i) - 1/12*
(4*B*b*d*i*n*x + 3*B*b*c*i*n + B*a*d*i*n)*log((b*x + a)/(d*x + c))/(b^6*g^5
*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5)
 + 1/144*(12*B*b^3*d^3*n*x^3 - 6*B*b^3*c*d^2*n*x^2 + 42*B*a*b^2*d^3*n*x^2 +
 4*B*b^3*c^2*d*n*x - 20*B*a*b^2*c*d^2*n*x + 52*B*a^2*b*d^3*n*x + 9*B*b^3*c^
3*n - 23*B*a*b^2*c^2*d*n + 13*B*a^2*b*c*d^2*n + 13*B*a^3*d^3*n + 48*A*b^3*c
^2*d*x + 48*B*b^3*c^2*d*x - 96*A*a*b^2*c*d^2*x - 96*B*a*b^2*c*d^2*x + 48*A*
a^2*b*d^3*x + 48*B*a^2*b*d^3*x + 36*A*b^3*c^3 + 36*B*b^3*c^3 - 60*A*a*b^2*c
^2*d - 60*B*a*b^2*c^2*d + 12*A*a^2*b*c*d^2 + 12*B*a^2*b*c*d^2 + 12*A*a^3*d^
```

```
3 + 12*B*a^3*d^3)/(b^8*c^2*g^5*i*x^4 - 2*a*b^7*c*d*g^5*i*x^4 + a^2*b^6*d^2*
g^5*i*x^4 + 4*a*b^7*c^2*g^5*i*x^3 - 8*a^2*b^6*c*d*g^5*i*x^3 + 4*a^3*b^5*d^2
*g^5*i*x^3 + 6*a^2*b^6*c^2*g^5*i*x^2 - 12*a^3*b^5*c*d*g^5*i*x^2 + 6*a^4*b^4
*d^2*g^5*i*x^2 + 4*a^3*b^5*c^2*g^5*i*x - 8*a^4*b^4*c*d*g^5*i*x + 4*a^5*b^3*
d^2*g^5*i*x + a^4*b^4*c^2*g^5*i - 2*a^5*b^3*c*d*g^5*i + a^6*b^2*d^2*g^5*i)
```

3.117 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=442

$$-\frac{3b^2g^3i^2(c+dx)^5(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^4}+\frac{b^3g^3i^2(c+dx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6d^4}-\frac{g^3i^2(c+dx)^3(bc-ad}{}$$

```
[Out] (B*(b*c - a*d)^5*g^3*i^2*n*x)/(60*b^2*d^3) + (B*(b*c - a*d)^4*g^3*i^2*n*(c
+ d*x)^2)/(120*b*d^4) - (19*B*(b*c - a*d)^3*g^3*i^2*n*(c + d*x)^3)/(180*d^4
) + (13*b*B*(b*c - a*d)^2*g^3*i^2*n*(c + d*x)^4)/(120*d^4) - (b^2*B*(b*c -
a*d)*g^3*i^2*n*(c + d*x)^5)/(30*d^4) - ((b*c - a*d)^3*g^3*i^2*(c + d*x)^3*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^4) + (3*b*(b*c - a*d)^2*g^3*i^2
*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^4) - (3*b^2*(b*c
- a*d)*g^3*i^2*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^4)
+ (b^3*g^3*i^2*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^4)
+ (B*(b*c - a*d)^6*g^3*i^2*n*Log[(a + b*x)/(c + d*x)])/(60*b^3*d^4) + (B*(b
*c - a*d)^6*g^3*i^2*n*Log[c + d*x])/(60*b^3*d^4)
```

Rubi [A] time = 0.685045, antiderivative size = 345, normalized size of antiderivative = 0.78, number of steps used = 14, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {2528, 2525, 12, 43}

$$\frac{d^2g^3i^2(a+bx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6b^3}+\frac{g^3i^2(a+bx)^4(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b^3}+\frac{2dg^3i^2(a+bx)^5(bc-ad)}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] -(B*(b*c - a*d)^5*g^3*i^2*n*x)/(60*b^2*d^3) + (B*(b*c - a*d)^4*g^3*i^2*n*(a
 + b*x)^2)/(120*b^3*d^2) - (B*(b*c - a*d)^3*g^3*i^2*n*(a + b*x)^3)/(180*b^3
*d) - (7*B*(b*c - a*d)^2*g^3*i^2*n*(a + b*x)^4)/(120*b^3) - (B*d*(b*c - a*d
)*g^3*i^2*n*(a + b*x)^5)/(30*b^3) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^3) + (2*d*(b*c - a*d)*g^3*i^2*(a +
 b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^3) + (d^2*g^3*i^2*(a +
 b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^3) + (B*(b*c - a*d)^6*
g^3*i^2*n*Log[c + d*x])/(60*b^3*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (117c+117dx)^2(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int \left(\frac{13689(bc-ad)^2(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2} +$$

$$= \frac{\left(13689(bc-ad)^2\right)\int (ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d}{b^2}$$

$$= \frac{13689(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3} + \frac{27}{}$$

$$= \frac{13689(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3} + \frac{27}{}$$

$$= \frac{13689(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3} + \frac{27}{}$$

$$= -\frac{4563B(bc-ad)^5g^3nx}{20b^2d^3} + \frac{4563B(bc-ad)^4g^3n(a+bx)^2}{40b^3d^2} -$$

Mathematica [A] time = 0.39755, size = 441, normalized size = 1.

$$\frac{g^3i^2\left(60d^6(a+bx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+144d^5(a+bx)^5(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+90d^4(a+bx)^4(bc-ad)^2}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^3*i^2*(90*d^4*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 144*d^5*(b*c - a*d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]) + 60*d^6*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 15*B*(b*
c - a*d)^3*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*
d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^2*n*(12*
b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(
a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) - B*(b*c -
a*d)*n*(60*b*d*(b*c - a*d)^4*x + 30*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 20*d
```

```
^3*(b*c - a*d)^2*(a + b*x)^3 + 15*d^4*(-(b*c) + a*d)*(a + b*x)^4 + 12*d^5*(
a + b*x)^5 - 60*(b*c - a*d)^5*Log[c + d*x]))/(360*b^3*d^4)
```

Maple [F] time = 0.631, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{3} (dix + ci)^{2} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.5242, size = 2670, normalized size = 6.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

```
[Out] 1/6*B*b^3*d^2*g^3*i^2*x^6*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/6*A*b^
3*d^2*g^3*i^2*x^6 + 2/5*B*b^3*c*d*g^3*i^2*x^5*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + 3/5*B*a*b^2*d^2*g^3*i^2*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 2/5*A*b^3*c*d*g^3*i^2*x^5 + 3/5*A*a*b^2*d^2*g^3*i^2*x^5 + 1/4*B*b^3*c
^2*g^3*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*B*a*b^2*c*d*g^3
*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/4*B*a^2*b*d^2*g^3*i^2*x
^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b^3*c^2*g^3*i^2*x^4 + 3/2
*A*a*b^2*c*d*g^3*i^2*x^4 + 3/4*A*a^2*b*d^2*g^3*i^2*x^4 + B*a*b^2*c^2*g^3*i^
2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*B*a^2*b*c*d*g^3*i^2*x^3*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*B*a^3*d^2*g^3*i^2*x^3*log(e*(b*x
/(d*x + c) + a/(d*x + c))^n) + A*a*b^2*c^2*g^3*i^2*x^3 + 2*A*a^2*b*c*d*g^3*
i^2*x^3 + 1/3*A*a^3*d^2*g^3*i^2*x^3 + 3/2*B*a^2*b*c^2*g^3*i^2*x^2*log(e*(b*
x/(d*x + c) + a/(d*x + c))^n) + B*a^3*c*d*g^3*i^2*x^2*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n) + 3/2*A*a^2*b*c^2*g^3*i^2*x^2 + A*a^3*c*d*g^3*i^2*x^2 - 1
/360*B*b^3*d^2*g^3*i^2*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6
 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 2
0*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^
5*c^5 - a^5*d^5)*x)/(b^5*d^5)) + 1/30*B*b^3*c*d*g^3*i^2*n*(12*a^5*log(b*x +
 a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4
*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 -
 a^4*d^4)*x)/(b^4*d^4)) + 1/20*B*a*b^2*d^2*g^3*i^2*n*(12*a^5*log(b*x + a)/b
^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*
d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*
d^4)*x)/(b^4*d^4)) - 1/24*B*b^3*c^2*g^3*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c
^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b
*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/4*B*a*b^2*c*d*g^3*i^2*n
*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d
^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3
)) - 1/8*B*a^2*b*d^2*g^3*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)
/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(
b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*B*a*b^2*c^2*g^3*i^2*n*(2*a^3*log(b*x
```

```
 + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2
- a^2*d^2)*x)/(b^2*d^2)) + B*a^2*b*c*d*g^3*i^2*n*(2*a^3*log(b*x + a)/b^3 -
2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x
)/(b^2*d^2)) + 1/6*B*a^3*d^2*g^3*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(
d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2
)) - 3/2*B*a^2*b*c^2*g^3*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
 + (b*c - a*d)*x/(b*d)) - B*a^3*c*d*g^3*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*l
og(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^3*c^2*g^3*i^2*n*(a*log(b*x + a
)/b - c*log(d*x + c)/d) + B*a^3*c^2*g^3*i^2*x*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + A*a^3*c^2*g^3*i^2*x
```

Fricas [B] time = 1.10175, size = 2202, normalized size = 4.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] 1/360*(60*A*b^6*d^6*g^3*i^2*x^6 + 6*(15*B*a^4*b^2*c^2*d^4 - 6*B*a^5*b*c*d^5
 + B*a^6*d^6)*g^3*i^2*n*log(b*x + a) + 6*(B*b^6*c^6 - 6*B*a*b^5*c^5*d + 15*
B*a^2*b^4*c^4*d^2 - 20*B*a^3*b^3*c^3*d^3)*g^3*i^2*n*log(d*x + c) - 12*((B*b
^6*c*d^5 - B*a*b^5*d^6)*g^3*i^2*n - 6*(2*A*b^6*c*d^5 + 3*A*a*b^5*d^6)*g^3*i
^2)*x^5 - 3*((7*B*b^6*c^2*d^4 + 6*B*a*b^5*c*d^5 - 13*B*a^2*b^4*d^6)*g^3*i^2
*n - 30*(A*b^6*c^2*d^4 + 6*A*a*b^5*c*d^5 + 3*A*a^2*b^4*d^6)*g^3*i^2)*x^4 -
2*((B*b^6*c^3*d^3 + 39*B*a*b^5*c^2*d^4 - 21*B*a^2*b^4*c*d^5 - 19*B*a^3*b^3*
d^6)*g^3*i^2*n - 60*(3*A*a*b^5*c^2*d^4 + 6*A*a^2*b^4*c*d^5 + A*a^3*b^3*d^6)
*g^3*i^2)*x^3 + 3*((B*b^6*c^4*d^2 - 6*B*a*b^5*c^3*d^3 - 30*B*a^2*b^4*c^2*d^
4 + 34*B*a^3*b^3*c*d^5 + B*a^4*b^2*d^6)*g^3*i^2*n + 60*(3*A*a^2*b^4*c^2*d^4
 + 2*A*a^3*b^3*c*d^5)*g^3*i^2)*x^2 + 6*(60*A*a^3*b^3*c^2*d^4*g^3*i^2 - (B*b
^6*c^5*d - 6*B*a*b^5*c^4*d^2 + 15*B*a^2*b^4*c^3*d^3 - 5*B*a^3*b^3*c^2*d^4 -
 6*B*a^4*b^2*c*d^5 + B*a^5*b*d^6)*g^3*i^2*n)*x + 6*(10*B*b^6*d^6*g^3*i^2*x^
6 + 60*B*a^3*b^3*c^2*d^4*g^3*i^2*x + 12*(2*B*b^6*c*d^5 + 3*B*a*b^5*d^6)*g^3
*i^2*x^5 + 15*(B*b^6*c^2*d^4 + 6*B*a*b^5*c*d^5 + 3*B*a^2*b^4*d^6)*g^3*i^2*x
^4 + 20*(3*B*a*b^5*c^2*d^4 + 6*B*a^2*b^4*c*d^5 + B*a^3*b^3*d^6)*g^3*i^2*x^3
 + 30*(3*B*a^2*b^4*c^2*d^4 + 2*B*a^3*b^3*c*d^5)*g^3*i^2*x^2)*log(e) + 6*(10
*B*b^6*d^6*g^3*i^2*n*x^6 + 60*B*a^3*b^3*c^2*d^4*g^3*i^2*n*x + 12*(2*B*b^6*c
*d^5 + 3*B*a*b^5*d^6)*g^3*i^2*n*x^5 + 15*(B*b^6*c^2*d^4 + 6*B*a*b^5*c*d^5 +
 3*B*a^2*b^4*d^6)*g^3*i^2*n*x^4 + 20*(3*B*a*b^5*c^2*d^4 + 6*B*a^2*b^4*c*d^5
 + B*a^3*b^3*d^6)*g^3*i^2*n*x^3 + 30*(3*B*a^2*b^4*c^2*d^4 + 2*B*a^3*b^3*c*d
^5)*g^3*i^2*n*x^2)*log((b*x + a)/(d*x + c)))/(b^3*d^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] Timed out
```

3.118 $\int (ag+bgx)^2(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=352

$$\frac{b^2g^2i^2(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^3}+\frac{g^2i^2(c+dx)^3(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d^3}-\frac{bg^2i^2(c+dx)^4(bc-ad)\left(B\log\right.}{2d^3}$$

```
[Out] -(B*(b*c - a*d)^4*g^2*i^2*n*x)/(30*b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*n*(c
 + d*x)^2)/(60*b*d^3) + (B*(b*c - a*d)^2*g^2*i^2*n*(c + d*x)^3)/(10*d^3) -
(b*B*(b*c - a*d)*g^2*i^2*n*(c + d*x)^4)/(20*d^3) + ((b*c - a*d)^2*g^2*i^2*(
c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^3) - (b*(b*c - a*d)
*g^2*i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^3) + (b^2
*g^2*i^2*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^3) - (B*(
b*c - a*d)^5*g^2*i^2*n*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) - (B*(b*c - a
*d)^5*g^2*i^2*n*Log[c + d*x])/(30*b^3*d^3)
```

Rubi [A] time = 0.543196, antiderivative size = 310, normalized size of antiderivative = 0.88, number of steps used = 14, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {2528, 2525, 12, 43}

$$\frac{d^2g^2i^2(a+bx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^3}+\frac{g^2i^2(a+bx)^3(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3}+\frac{dg^2i^2(a+bx)^4(bc-ad)\left(B\log\right.}{2b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] (B*(b*c - a*d)^4*g^2*i^2*n*x)/(30*b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*n*(a
+ b*x)^2)/(60*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*n*(a + b*x)^3)/(10*b^3) - (
B*d*(b*c - a*d)*g^2*i^2*n*(a + b*x)^4)/(20*b^3) + ((b*c - a*d)^2*g^2*i^2*(a
 + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3) + (d*(b*c - a*d)*
g^2*i^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^3) + (d^2*
g^2*i^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^3) - (B*(b
*c - a*d)^5*g^2*i^2*n*Log[c + d*x])/(30*b^3*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (118c+118dx)^2(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int\left(\frac{(-bc+ad)^2g^2(118c+118dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{d^2}\right.$$

$$=\frac{\left(b^2g^2\right)\int(118c+118dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{13924d^2}-$$

$$=\frac{13924(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d^3}-$$

$$=\frac{13924(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d^3}-$$

$$=\frac{13924(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d^3}-$$

$$=-\frac{6962B(bc-ad)^4g^2nx}{15b^2d^2}-\frac{3481B(bc-ad)^3g^2n(c+dx)^2}{15bd^3}$$

Mathematica [A] time = 0.26903, size = 374, normalized size = 1.06

$$\frac{g^2i^2\left(12d^5(a+bx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+30d^4(a+bx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+20d^3(a+bx)^3(bc-ad\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^2*i^2*(20*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 30*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) + 12*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 10*B*(b*c
 - a*d)^3*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c
+ d*x]) - 5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)
*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + B*(b*c -
 a*d)*n*(12*b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(
b*c - a*d)*(a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x])
))/(60*b^3*d^3)
```

Maple [F] time = 0.59, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2} \left(dix+ci\right)^{2} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.44025, size = 1804, normalized size = 5.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

```
[Out] 1/5*B*b^2*d^2*g^2*i^2*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A*b^
2*d^2*g^2*i^2*x^5 + 1/2*B*b^2*c*d*g^2*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + 1/2*B*a*b*d^2*g^2*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
) + 1/2*A*b^2*c*d*g^2*i^2*x^4 + 1/2*A*a*b*d^2*g^2*i^2*x^4 + 1/3*B*b^2*c^2*g
^2*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 4/3*B*a*b*c*d*g^2*i^2*x
^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*B*a^2*d^2*g^2*i^2*x^3*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*b^2*c^2*g^2*i^2*x^3 + 4/3*A*a*b*c
*d*g^2*i^2*x^3 + 1/3*A*a^2*d^2*g^2*i^2*x^3 + B*a*b*c^2*g^2*i^2*x^2*log(e*(b
*x/(d*x + c) + a/(d*x + c))^n) + B*a^2*c*d*g^2*i^2*x^2*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n) + A*a*b*c^2*g^2*i^2*x^2 + A*a^2*c*d*g^2*i^2*x^2 + 1/60*B
*b^2*d^2*g^2*i^2*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*
(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^
3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/12*B*b^2*c*
d*g^2*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^
2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*
x)/(b^3*d^3)) - 1/12*B*a*b*d^2*g^2*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*lo
g(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/6*B*b^2*c^2*g^2*i^2*n*(2*a^3
*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(
b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 2/3*B*a*b*c*d*g^2*i^2*n*(2*a^3*log(b*x +
 a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2)) + 1/6*B*a^2*d^2*g^2*i^2*n*(2*a^3*log(b*x + a)/b^3 -
2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x
)/(b^2*d^2)) - B*a*b*c^2*g^2*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)
/d^2 + (b*c - a*d)*x/(b*d)) - B*a^2*c*d*g^2*i^2*n*(a^2*log(b*x + a)/b^2 - c
^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^2*c^2*g^2*i^2*n*(a*log(b*x
 + a)/b - c*log(d*x + c)/d) + B*a^2*c^2*g^2*i^2*x*log(e*(b*x/(d*x + c) + a/
(d*x + c))^n) + A*a^2*c^2*g^2*i^2*x
```

Fricas [B] time = 0.804151, size = 1573, normalized size = 4.47

$$\frac{12\,Ab^{5}d^{5}g^{2}i^{2}x^{5} + 2\left(10\,Ba^{3}b^{2}c^{2}d^{3} - 5\,Ba^{4}bcd^{4} + Ba^{5}d^{5}\right)g^{2}i^{2}n\log\left(bx+a\right) - 2\left(Bb^{5}c^{5} - 5\,Bab^{4}c^{4}d + 10\,Ba^{2}b^{3}c^{3}d^{2}\right)g^{2}i^{2}n\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^2*i^2*x^5 + 2*(10*B*a^3*b^2*c^2*d^3 - 5*B*a^4*b*c*d^4
+ B*a^5*d^5)*g^2*i^2*n*log(b*x + a) - 2*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B
*a^2*b^3*c^3*d^2)*g^2*i^2*n*log(d*x + c) - 3*((B*b^5*c*d^4 - B*a*b^4*d^5)*g
^2*i^2*n - 10*(A*b^5*c*d^4 + A*a*b^4*d^5)*g^2*i^2)*x^4 - 2*(3*(B*b^5*c^2*d^
3 - B*a^2*b^3*d^5)*g^2*i^2*n - 10*(A*b^5*c^2*d^3 + 4*A*a*b^4*c*d^4 + A*a^2*
b^3*d^5)*g^2*i^2)*x^3 - ((B*b^5*c^3*d^2 + 15*B*a*b^4*c^2*d^3 - 15*B*a^2*b^3
*c*d^4 - B*a^3*b^2*d^5)*g^2*i^2*n - 60*(A*a*b^4*c^2*d^3 + A*a^2*b^3*c*d^4)*
g^2*i^2)*x^2 + 2*(30*A*a^2*b^3*c^2*d^3*g^2*i^2 + (B*b^5*c^4*d - 5*B*a*b^4*c
^3*d^2 + 5*B*a^3*b^2*c*d^4 - B*a^4*b*d^5)*g^2*i^2*n)*x + 2*(6*B*b^5*d^5*g^2
*i^2*x^5 + 30*B*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(B*b^5*c*d^4 + B*a*b^4*d^5)*
g^2*i^2*x^4 + 10*(B*b^5*c^2*d^3 + 4*B*a*b^4*c*d^4 + B*a^2*b^3*d^5)*g^2*i^2*
x^3 + 30*(B*a*b^4*c^2*d^3 + B*a^2*b^3*c*d^4)*g^2*i^2*x^2)*log(e) + 2*(6*B*b
^5*d^5*g^2*i^2*n*x^5 + 30*B*a^2*b^3*c^2*d^3*g^2*i^2*n*x + 15*(B*b^5*c*d^4 +
 B*a*b^4*d^5)*g^2*i^2*n*x^4 + 10*(B*b^5*c^2*d^3 + 4*B*a*b^4*c*d^4 + B*a^2*b
^3*d^5)*g^2*i^2*n*x^3 + 30*(B*a*b^4*c^2*d^3 + B*a^2*b^3*c*d^4)*g^2*i^2*n*x^
2)*log((b*x + a)/(d*x + c)))/(b^3*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] Timed out
```

3.119 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=250

$$-\frac{gi^2(c+dx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d^2}+\frac{bgi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^2}+\frac{Bgi^2n(bc-ad)^4\log\left(\frac{a+bx}{c+dx}\right)}{12b^3d^2}+$$

```
[Out] (B*(b*c - a*d)^3*g*i^2*n*x)/(12*b^2*d) + (B*(b*c - a*d)^2*g*i^2*n*(c + d*x)
^2)/(24*b*d^2) - (B*(b*c - a*d)*g*i^2*n*(c + d*x)^3)/(12*d^2) - ((b*c - a*d
)*g*i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^2) + (b*g*
i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^2) + (B*(b*c -
 a*d)^4*g*i^2*n*Log[(a + b*x)/(c + d*x)])/(12*b^3*d^2) + (B*(b*c - a*d)^4*g
*i^2*n*Log[c + d*x])/(12*b^3*d^2)
```

Rubi [A] time = 0.354676, antiderivative size = 210, normalized size of antiderivative = 0.84, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 43}

$$-\frac{gi^2(c+dx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d^2}+\frac{bgi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^2}+\frac{Bgi^2n(bc-ad)^4\log(a+bx)}{12b^3d^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*(b*c - a*d)^3*g*i^2*n*x)/(12*b^2*d) + (B*(b*c - a*d)^2*g*i^2*n*(c + d*x)
^2)/(24*b*d^2) - (B*(b*c - a*d)*g*i^2*n*(c + d*x)^3)/(12*d^2) + (B*(b*c - a
*d)^4*g*i^2*n*Log[a + b*x])/(12*b^3*d^2) - ((b*c - a*d)*g*i^2*(c + d*x)^3*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^2) + (b*g*i^2*(c + d*x)^4*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (119c+119dx)^2(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int\left(\frac{(-bc+ad)g(119c+119dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d}\right.$$

$$=\frac{(bg)\int(119c+119dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{119d}+\frac{((-}{}$$

$$=-\frac{14161(bc-ad)g(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d^2}+\frac{14}{}$$

$$=-\frac{14161(bc-ad)g(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d^2}+\frac{14}{}$$

$$=-\frac{14161(bc-ad)g(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d^2}+\frac{14}{}$$

$$=\frac{14161B(bc-ad)^3gnx}{12b^2d}+\frac{14161B(bc-ad)^2gn(c+dx)^2}{24bd^2}-$$

Mathematica [A] time = 0.199186, size = 224, normalized size = 0.9

$$\frac{gi^2\left(6b(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-8(c+dx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+\frac{4Bn(bc-ad)^2\left(2bdx(bc-ad)+2(bc-ad)^2\right.}{b^3}\right.}{24d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g*i^2*((4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*
c - a*d)^2*Log[a + b*x]))/b^3 - (B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3
*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a +
b*x]))/b^3 - 8*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) + 6*b*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(24*d^2)
```

Maple [F] time = 0.507, size = 0, normalized size = 0.

$$\int (bgx+ag)(dix+ci)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.33983, size = 999, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] 1/4*B*b*d^2*g*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b*d^2*
g*i^2*x^4 + 2/3*B*b*c*d*g*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
1/3*B*a*d^2*g*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*A*b*c*d*
g*i^2*x^3 + 1/3*A*a*d^2*g*i^2*x^3 + 1/2*B*b*c^2*g*i^2*x^2*log(e*(b*x/(d*x +
 c) + a/(d*x + c))^n) + B*a*c*d*g*i^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) + 1/2*A*b*c^2*g*i^2*x^2 + A*a*c*d*g*i^2*x^2 - 1/24*B*b*d^2*g*i^2*n*(6
*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
+ 1/3*B*b*c*d*g*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/6*B*a*d^2*
g*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*
d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/2*B*b*c^2*g*i^2*n*(a^2*l
og(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - B*a*c*d*g*i
^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
B*a*c^2*g*i^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*a*c^2*g*i^2*x*log
(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*c^2*g*i^2*x
```

Fricas [B] time = 0.65275, size = 1107, normalized size = 4.43

$$\frac{6\,Ab^4d^4gi^2x^4 + 2\left(6\,Ba^2b^2c^2d^2 - 4\,Ba^3bcd^3 + Ba^4d^4\right)gi^2n\log\left(bx+a\right) + 2\left(Bb^4c^4 - 4\,Bab^3c^3d\right)gi^2n\log\left(dx+c\right) - 2\left(\left(Bb^4c\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g*i^2*x^4 + 2*(6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 + B*
a^4*d^4)*g*i^2*n*log(b*x + a) + 2*(B*b^4*c^4 - 4*B*a*b^3*c^3*d)*g*i^2*n*log
(d*x + c) - 2*((B*b^4*c*d^3 - B*a*b^3*d^4)*g*i^2*n - 4*(2*A*b^4*c*d^3 + A*a
*b^3*d^4)*g*i^2)*x^3 - ((5*B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 - B*a^2*b^2*d^4)
*g*i^2*n - 12*(A*b^4*c^2*d^2 + 2*A*a*b^3*c*d^3)*g*i^2)*x^2 + 2*(12*A*a*b^3*
c^2*d^2*g*i^2 - (B*b^4*c^3*d + 2*B*a*b^3*c^2*d^2 - 4*B*a^2*b^2*c*d^3 + B*a^
3*b*d^4)*g*i^2*n)*x + 2*(3*B*b^4*d^4*g*i^2*x^4 + 12*B*a*b^3*c^2*d^2*g*i^2*x
 + 4*(2*B*b^4*c*d^3 + B*a*b^3*d^4)*g*i^2*x^3 + 6*(B*b^4*c^2*d^2 + 2*B*a*b^3
*c*d^3)*g*i^2*x^2)*log(e) + 2*(3*B*b^4*d^4*g*i^2*n*x^4 + 12*B*a*b^3*c^2*d^2
*g*i^2*n*x + 4*(2*B*b^4*c*d^3 + B*a*b^3*d^4)*g*i^2*n*x^3 + 6*(B*b^4*c^2*d^2
 + 2*B*a*b^3*c*d^3)*g*i^2*n*x^2)*log((b*x + a)/(d*x + c)))/(b^3*d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="giac")
```

```
[Out] Timed out
```

3.120 $\int (ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=124

$$\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d}-\frac{Bi^2nx(bc-ad)^2}{3b^2}-\frac{Bi^2n(bc-ad)^3\log(a+bx)}{3b^3d}-\frac{Bi^2n(c+dx)^2(bc-ad)}{6bd}$$

```
[Out] -(B*(b*c - a*d)^2*i^2*n*x)/(3*b^2) - (B*(b*c - a*d)*i^2*n*(c + d*x)^2)/(6*b
*d) - (B*(b*c - a*d)^3*i^2*n*Log[a + b*x])/(3*b^3*d) + (i^2*(c + d*x)^3*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d)
```

Rubi [A] time = 0.07449, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

$$\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d}-\frac{Bi^2nx(bc-ad)^2}{3b^2}-\frac{Bi^2n(bc-ad)^3\log(a+bx)}{3b^3d}-\frac{Bi^2n(c+dx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2*n*x)/(3*b^2) - (B*(b*c - a*d)*i^2*n*(c + d*x)^2)/(6*b
*d) - (B*(b*c - a*d)^3*i^2*n*Log[a + b*x])/(3*b^3*d) + (i^2*(c + d*x)^3*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (120c+120dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{4800(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(Bn)\int \frac{1728000(bc-ad)(c+dx)}{a+bx}}{360d}$$

$$= \frac{4800(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(4800B(bc-ad)n)\int \frac{(c+c}{a+}}{d}$$

$$= \frac{4800(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(4800B(bc-ad)n)\int \left(\frac{d(l}{}\right.}{}$$

$$= -\frac{4800B(bc-ad)^2nx}{b^2} - \frac{2400B(bc-ad)n(c+dx)^2}{bd} - \frac{4800B(bc-a}{}$$

Mathematica [A] time = 0.0471789, size = 101, normalized size = 0.81

$$\frac{i^2\left((c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)\left(2bdx(bc-ad)+2(bc-ad)^2\log(a+bx)+b^2(c+dx)^2\right)}{2b^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (i^2*(-(B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a
*d)^2*Log[a + b*x]))/(2*b^3) + (c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])))/(3*d)
```

Maple [F] time = 0.457, size = 0, normalized size = 0.

$$\int (dix+ci)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.32109, size = 417, normalized size = 3.36

$$\frac{1}{3}Bd^2i^2x^3\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{3}Ad^2i^2x^3+Bcdi^2x^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+Acdi^2x^2+\frac{1}{6}Bd^2i^2n\left(\frac{2a^3\log}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] 1/3*B*d^2*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*d^2*i^2*x^
3 + B*c*d*i^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c*d*i^2*x^2 +
```

```
1/6*B*d^2*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - B*c*d*i^2*n*(a^2*l
og(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*c^2*i^2*n
*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*c^2*i^2*x*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n) + A*c^2*i^2*x
```

Fricas [B] time = 0.561858, size = 622, normalized size = 5.02

$$\frac{2\,Ab^3d^3i^2x^3 - 2\,Bb^3c^3i^2n\log\left(dx+c\right) + 2\left(3\,Bab^2c^2d - 3\,Ba^2bcd^2 + Ba^3d^3\right)i^2n\log\left(bx+a\right) + \left(6\,Ab^3cd^2i^2 - \left(Bb^3cd^2 - Bab\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] 1/6*(2*A*b^3*d^3*i^2*x^3 - 2*B*b^3*c^3*i^2*n*log(d*x + c) + 2*(3*B*a*b^2*c^
2*d - 3*B*a^2*b*c*d^2 + B*a^3*d^3)*i^2*n*log(b*x + a) + (6*A*b^3*c*d^2*i^2
- (B*b^3*c*d^2 - B*a*b^2*d^3)*i^2*n)*x^2 + 2*(3*A*b^3*c^2*d*i^2 - (2*B*b^3*
c^2*d - 3*B*a*b^2*c*d^2 + B*a^2*b*d^3)*i^2*n)*x + 2*(B*b^3*d^3*i^2*x^3 + 3*
B*b^3*c*d^2*i^2*x^2 + 3*B*b^3*c^2*d*i^2*x)*log(e) + 2*(B*b^3*d^3*i^2*n*x^3
+ 3*B*b^3*c*d^2*i^2*n*x^2 + 3*B*b^3*c^2*d*i^2*n*x)*log((b*x + a)/(d*x + c))
)/(b^3*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 3.4415, size = 277, normalized size = 2.23

$$\frac{Bc^3n\log\left(dx+c\right)}{3\,d} - \frac{1}{3}\left(Ad^2+Bd^2\right)x^3 + \frac{\left(Bbcdn - Bad^2n - 6\,Abcd - 6\,Bbcd\right)x^2}{6\,b} - \frac{1}{3}\left(Bd^2nx^3 + 3\,Bcdnx^2 + 3\,Bc^2nx\right)\log\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] 1/3*B*c^3*n*log(d*x + c)/d - 1/3*(A*d^2 + B*d^2)*x^3 + 1/6*(B*b*c*d*n - B*a
*d^2*n - 6*A*b*c*d - 6*B*b*c*d)*x^2/b - 1/3*(B*d^2*n*x^3 + 3*B*c*d*n*x^2 +
3*B*c^2*n*x)*log((b*x + a)/(d*x + c)) + 1/3*(2*B*b^2*c^2*n - 3*B*a*b*c*d*n
+ B*a^2*d^2*n - 3*A*b^2*c^2 - 3*B*b^2*c^2)*x/b^2 - 1/3*(3*B*a*b^2*c^2*n - 3
*B*a^2*b*c*d*n + B*a^3*d^2*n)*log(b*x + a)/b^3
```

3.121 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=289

$$\frac{Bi^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}+\frac{di^2(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}-\frac{i^2(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\right.}{b^3g}$$

```
[Out] -(B*d*(b*c - a*d)*i^2*n*x)/(2*b^2*g) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/(2*b*g) - (B*(b*c - a*d)^2*i^2*n*Log[(a + b*x)/(c
+ d*x)])/(2*b^3*g) - (3*B*(b*c - a*d)^2*i^2*n*Log[c + d*x])/(2*b^3*g) - ((b
*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x)
)/(d*(a + b*x))])/(b^3*g) + (B*(b*c - a*d)^2*i^2*n*PolyLog[2, (b*(c + d*x))
/(d*(a + b*x))])/(b^3*g)
```

Rubi [A] time = 0.489496, antiderivative size = 369, normalized size of antiderivative = 1.28, number of steps used = 18, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2524, 2418, 2390, 12, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^2n(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^3g}+\frac{i^2(bc-ad)^2\log(ag+bgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}+\frac{Adi^2x(bc-ad)}{b^2g}+\frac{i^2(c+}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x),
x]
```

```
[Out] (A*d*(b*c - a*d)*i^2*x)/(b^2*g) - (B*d*(b*c - a*d)*i^2*n*x)/(2*b^2*g) - (B*
(b*c - a*d)^2*i^2*n*Log[a + b*x])/(2*b^3*g) - (B*(b*c - a*d)^2*i^2*n*Log[g*
(a + b*x)]^2)/(2*b^3*g) + (B*d*(b*c - a*d)*i^2*(a + b*x)*Log[e*((a + b*x)/(
c + d*x))^n])/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(2*b*g) - (B*(b*c - a*d)^2*i^2*n*Log[c + d*x])/(b^3*g) + ((b*c - a*d)
^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[a*g + b*g*x])/(b^3*g) + (
B*(b*c - a*d)^2*i^2*n*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b^3
*g) + (B*(b*c - a*d)^2*i^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3
*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
```

```
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(121c+121dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx = \int \left(\frac{14641d(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g} + \frac{121d(121c+121dx)\left(\right.}{}\right.$$

$$= \frac{\left(14641(bc-ad)^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ag+bgx}\,dx}{b^2} + \frac{(121d)\int(121c+121dx)\left(\right.}{b}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} + \frac{14641(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2bg} + \frac{146}{}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} + \frac{14641Bd(bc-ad)(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g} + \frac{1}{}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} + \frac{14641Bd(bc-ad)(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g} + \frac{1}{}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} - \frac{14641Bd(bc-ad)nx}{2b^2g} - \frac{14641B(bc-ad)^2n\log}{2b^3g}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} - \frac{14641Bd(bc-ad)nx}{2b^2g} - \frac{14641B(bc-ad)^2n\log}{2b^3g}$$

$$= \frac{14641Ad(bc-ad)x}{b^2g} - \frac{14641Bd(bc-ad)nx}{2b^2g} - \frac{14641B(bc-ad)^2n\log}{2b^3g}$$

Mathematica [A] time = 0.185614, size = 264, normalized size = 0.91

$$\frac{i^2\left(Bn(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)-\log(g(a+bx))\left(\log(g(a+bx))-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)+b^2(c+dx)^2\left(B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x),x]
```

```
[Out] (i^2*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a +
b*x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*(c
 + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[g*(a
```

```
 + b*x)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c
 + d*x] + B*(b*c - a*d)^2*n*(-(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*Log[(
b*(c + d*x))/(b*c - a*d)])) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
/(2*b^3*g)
```

Maple [F] time = 0.686, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

Maxima [B] time = 3.19895, size = 783, normalized size = 2.71

$$2\,Acdi^2\left(\frac{x}{bg}-\frac{a\log(bx+a)}{b^2g}\right)+\frac{1}{2}\,Ad^2i^2\left(\frac{2\,a^2\log(bx+a)}{b^3g}+\frac{bx^2-2\,ax}{b^2g}\right)+\frac{Ac^2i^2\log\left(bgx+ag\right)}{bg}-\frac{\left(3\,bc^2i^2n-2\,acdi^2n\right)B}{2\,b^2g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="maxima")
```

```
[Out] 2*A*c*d*i^2*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/2*A*d^2*i^2*(2*a^2*log(b
*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A*c^2*i^2*log(b*g*x + a*g)/(b*
g) - 1/2*(3*b*c^2*i^2*n - 2*a*c*d*i^2*n)*B*log(d*x + c)/(b^2*g) + (b^2*c^2*
i^2*n - 2*a*b*c*d*i^2*n + a^2*d^2*i^2*n)*(log(b*x + a)*log((b*d*x + a*d)/(b
*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^3*g) + 1/2*(B*b^2*
d^2*i^2*x^2*log(e) - (b^2*c^2*i^2*n - 2*a*b*c*d*i^2*n + a^2*d^2*i^2*n)*B*lo
g(b*x + a)^2 - ((i^2*n - 4*i^2*log(e))*b^2*c*d - (i^2*n - 2*i^2*log(e))*a*b
*d^2)*B*x + (2*b^2*c^2*i^2*log(e) + 4*(i^2*n - i^2*log(e))*a*b*c*d - (3*i^2
*n - 2*i^2*log(e))*a^2*d^2)*B*log(b*x + a) + (B*b^2*d^2*i^2*x^2 + 2*(2*b^2*
c*d*i^2 - a*b*d^2*i^2)*B*x + 2*(b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*
B*log(b*x + a))*log((b*x + a)^n) - (B*b^2*d^2*i^2*x^2 + 2*(2*b^2*c*d*i^2 -
a*b*d^2*i^2)*B*x + 2*(b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B*log(b*x
+ a))*log((d*x + c)^n))/(b^3*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^2i^2x^2+2\,Acdi^2x+Ac^2i^2+\left(Bd^2i^2x^2+2\,Bcdi^2x+Bc^2i^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="fricas")
```

```
[Out] integral((A*d^2*i^2*x^2 + 2*A*c*d*i^2*x + A*c^2*i^2 + (B*d^2*i^2*x^2 + 2*B*
c*d*i^2*x + B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n))/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left(B \log \left(e \left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{bgx + ag}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g), x)
```

3.122 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=259

$$\frac{2Bdi^2n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2}+\frac{d^2i^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2}-\frac{i^2(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right.}{b^2g^2(a+bx)}$$

```
[Out] -((B*(b*c - a*d)*i^2*n*(c + d*x))/(b^2*g^2*(a + b*x))) + (d^2*i^2*(a + b*x)
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2) - ((b*c - a*d)*i^2*(c +
d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2*(a + b*x)) - (B*d*(b*
c - a*d)*i^2*n*Log[c + d*x])/(b^3*g^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) +
 (2*B*d*(b*c - a*d)*i^2*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2
)
```

Rubi [A] time = 0.522551, antiderivative size = 327, normalized size of antiderivative = 1.26, number of steps used = 17, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2Bdi^2n(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^3g^2}+\frac{2di^2(bc-ad)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2}-\frac{i^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{b^3g^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
2,x]
```

```
[Out] (A*d^2*i^2*x)/(b^2*g^2) - (B*(b*c - a*d)^2*i^2*n)/(b^3*g^2*(a + b*x)) - (B*
d*(b*c - a*d)*i^2*n*Log[a + b*x])/(b^3*g^2) - (B*d*(b*c - a*d)*i^2*n*Log[a
+ b*x]^2)/(b^3*g^2) + (B*d^2*i^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/
(b^3*g^2) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3
*g^2*(a + b*x)) + (2*d*(b*c - a*d)*i^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(b^3*g^2) + (2*B*d*(b*c - a*d)*i^2*n*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(b^3*g^2) + (2*B*d*(b*c - a*d)*i^2*n*PolyLog[2, -((
d*(a + b*x))/(b*c - a*d))])/(b^3*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(122c+122dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx = \int\left(\frac{14884d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2}+\frac{14884(bc-ad)^2\left(A+B\log\left(e\left(\right.\right.\right.}{b^2g^2(a+bx)^2}\right.$$

$$=\frac{\left(14884d^2\right)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{b^2g^2}+\frac{(29768d(bc-ad))\int\frac{A+B\log}{a}}{b^2g^2}$$

$$=\frac{14884Ad^2x}{b^2g^2}-\frac{14884(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^2(a+bx)}+\frac{29768d(bc-}{}$$

$$=\frac{14884Ad^2x}{b^2g^2}+\frac{14884Bd^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2}-\frac{14884(bc-ad)^2\left(A\right.}{b^3g^2(}$$

$$=\frac{14884Ad^2x}{b^2g^2}+\frac{14884Bd^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2}-\frac{14884(bc-ad)^2\left(A\right.}{b^3g^2(}$$

$$=\frac{14884Ad^2x}{b^2g^2}-\frac{14884B(bc-ad)^2n}{b^3g^2(a+bx)}-\frac{14884Bd(bc-ad)n\log(a+bx)}{b^3g^2}+$$

$$=\frac{14884Ad^2x}{b^2g^2}-\frac{14884B(bc-ad)^2n}{b^3g^2(a+bx)}-\frac{14884Bd(bc-ad)n\log(a+bx)}{b^3g^2}-$$

$$=\frac{14884Ad^2x}{b^2g^2}-\frac{14884B(bc-ad)^2n}{b^3g^2(a+bx)}-\frac{14884Bd(bc-ad)n\log(a+bx)}{b^3g^2}-$$

Mathematica [A] time = 0.236218, size = 233, normalized size = 0.9

$$\frac{i^2\left(Bdn(ad-bc)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2d(bc-ad)\log(a+bx)\left(B\log\left(e\right.\right.\right.}{b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^2,x]
```

```
[Out] (i^2*(A*b*d^2*x - (B*(b*c - a*d)^2*n)/(a + b*x) + B*d*(-(b*c) + a*d)*n*Log[
a + b*x] + B*d^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - ((b*c - a*d)^2*
```

```
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 2*d*(b*c - a*d)*Log[a +
 b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + B*d*(-(b*c) + a*d)*n*(Log[a
+ b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)])))/(b^3*g^2)
```

Maple [F] time = 0.695, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{(bgx+ag)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

Maxima [B] time = 2.80036, size = 1607, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="maxima")
```

```
[Out] -B*c^2*i^2*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2
) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - A*(a^2/(b^4*g^2*x + a*b^3*g^2)
- x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*d^2*i^2 + 2*A*c*d*i^2*(a/(b^3*g
^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - B*c^2*i^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)/(b^2*g^2*x + a*b*g^2) - A*c^2*i^2/(b^2*g^2*x + a*b*g^2)
 - (b^2*c^2*d*i^2*n + a*b*c*d^2*i^2*n - a^2*d^3*i^2*n)*B*log(d*x + c)/(b^4*
c*g^2 - a*b^3*d*g^2) + ((b^3*c*d^2*i^2*log(e) - a*b^2*d^3*i^2*log(e))*B*x^2
 + (a*b^2*c*d^2*i^2*log(e) - a^2*b*d^3*i^2*log(e))*B*x - ((b^3*c^2*d*i^2*n
- 2*a*b^2*c*d^2*i^2*n + a^2*b*d^3*i^2*n)*B*x + (a*b^2*c^2*d*i^2*n - 2*a^2*b
*c*d^2*i^2*n + a^3*d^3*i^2*n)*B)*log(b*x + a)^2 + (2*(i^2*n + i^2*log(e))*a
*b^2*c^2*d - 3*(i^2*n + i^2*log(e))*a^2*b*c*d^2 + (i^2*n + i^2*log(e))*a^3*
d^3)*B + ((2*b^3*c^2*d*i^2*log(e) + (3*i^2*n - 4*i^2*log(e))*a*b^2*c*d^2 -
2*(i^2*n - i^2*log(e))*a^2*b*d^3)*B*x + (2*a*b^2*c^2*d*i^2*log(e) + (3*i^2*
n - 4*i^2*log(e))*a^2*b*c*d^2 - 2*(i^2*n - i^2*log(e))*a^3*d^3)*B)*log(b*x
+ a) + ((b^3*c*d^2*i^2 - a*b^2*d^3*i^2)*B*x^2 + (a*b^2*c*d^2*i^2 - a^2*b*d^
3*i^2)*B*x + (2*a*b^2*c^2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B + 2*((
b^3*c^2*d*i^2 - 2*a*b^2*c*d^2*i^2 + a^2*b*d^3*i^2)*B*x + (a*b^2*c^2*d*i^2 -
 2*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B)*log(b*x + a))*log((b*x + a)^n) - ((b^3
*c*d^2*i^2 - a*b^2*d^3*i^2)*B*x^2 + (a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2)*B*x +
 (2*a*b^2*c^2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B + 2*((b^3*c^2*d*i^
2 - 2*a*b^2*c*d^2*i^2 + a^2*b*d^3*i^2)*B*x + (a*b^2*c^2*d*i^2 - 2*a^2*b*c*d
^2*i^2 + a^3*d^3*i^2)*B)*log(b*x + a))*log((d*x + c)^n))/(a*b^4*c*g^2 - a^2
*b^3*d*g^2 + (b^5*c*g^2 - a*b^4*d*g^2)*x) + 2*(b*c*d*i^2*n - a*d^2*i^2*n)*(
log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c
 - a*d)))*B/(b^3*g^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^2i^2x^2 + 2\,Acdi^2x + Ac^2i^2 + \left(Bd^2i^2x^2 + 2\,Bcdi^2x + Bc^2i^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((A*d^2*i^2*x^2 + 2*A*c*d*i^2*x + A*c^2*i^2 + (B*d^2*i^2*x^2 + 2*B*
c*d*i^2*x + B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n))/(b^2*g^2*x^2 + 2*a*b
*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{\left(bgx + ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g)^2, x)
```

3.123 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=242

$$\frac{Bd^2i^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3}-\frac{di^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^3(a+bx)}-\cdots$$

```
[Out] -((B*d*i^2*n*(c + d*x))/(b^2*g^3*(a + b*x))) - (B*i^2*n*(c + d*x)^2)/(4*b*g
^3*(a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^2*g^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/(2*b*g^3*(a + b*x)^2) - (d^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (B*d^2*i^2*n*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3)
```

Rubi [A] time = 0.560004, antiderivative size = 354, normalized size of antiderivative = 1.46, number of steps used = 18, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^2i^2n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^3g^3}+\frac{d^2i^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3}-\frac{2di^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3(a+bx)}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
3,x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2*n)/(4*b^3*g^3*(a + b*x)^2) - (3*B*d*(b*c - a*d)*i^2*n
)/(2*b^3*g^3*(a + b*x)) - (3*B*d^2*i^2*n*Log[a + b*x])/(2*b^3*g^3) - (B*d^2
*i^2*n*Log[a + b*x]^2)/(2*b^3*g^3) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/(2*b^3*g^3*(a + b*x)^2) - (2*d*(b*c - a*d)*i^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3*(a + b*x)) + (d^2*i^2*Log[a + b*x
]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3) + (3*B*d^2*i^2*n*Log[c
+ d*x])/(2*b^3*g^3) + (B*d^2*i^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*
d)])/(b^3*g^3) + (B*d^2*i^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^
3*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(123c+123dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx = \int \left(\frac{15129(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^3(a+bx)^3} + \frac{30258d(bc-ad)\left(A\right.}{b^2g^3(a\right.}$$

$$= \frac{(15129d^2)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{b^2g^3} + \frac{(30258d(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.}{(a+bx)^2}}{b^2g^3}$$

$$= -\frac{15129(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^3g^3(a+bx)^2} - \frac{30258d(bc-ad)\left(A+\right.}{b^3g^3(a+}$$

$$= -\frac{15129(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^3g^3(a+bx)^2} - \frac{30258d(bc-ad)\left(A+\right.}{b^3g^3(a+}$$

$$= -\frac{15129(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^3g^3(a+bx)^2} - \frac{30258d(bc-ad)\left(A+\right.}{b^3g^3(a+}$$

$$= -\frac{15129B(bc-ad)^2n}{4b^3g^3(a+bx)^2} - \frac{45387Bd(bc-ad)n}{2b^3g^3(a+bx)} - \frac{45387Bd^2n\log(a+bx}{2b^3g^3}$$

$$= -\frac{15129B(bc-ad)^2n}{4b^3g^3(a+bx)^2} - \frac{45387Bd(bc-ad)n}{2b^3g^3(a+bx)} - \frac{45387Bd^2n\log(a+bx}{2b^3g^3}$$

$$= -\frac{15129B(bc-ad)^2n}{4b^3g^3(a+bx)^2} - \frac{45387Bd(bc-ad)n}{2b^3g^3(a+bx)} - \frac{45387Bd^2n\log(a+bx}{2b^3g^3}$$

Mathematica [A] time = 0.354789, size = 258, normalized size = 1.07

$$i^2\left(-2Bd^2n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+4d^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^3,x]
```

```
[Out] (i^2*(-((B*(b*c - a*d)^2*n)/(a + b*x)^2) + (6*B*d*(-(b*c) + a*d)*n)/(a + b*
x) - 6*B*d^2*n*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/(a + b*x)^2 + (8*d*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(a + b*x) + 4*d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]) + 6*B*d^2*n*Log[c + d*x] - 2*B*d^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)
])))/(4*b^3*g^3)
```

Maple [F] time = 0.671, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{(bgx+ag)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] -1/2*B*c*d*i^2*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4
*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3)
+ 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g
^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^
2)*g^3)) + 1/4*B*c^2*i^2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*
x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*lo
g(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/(
(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) + 1/2*A*d^2*i^2*((4*a*b*x + 3*a^2
)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) +
 1/2*B*d^2*i^2*(((4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b*x + a
))*log((b*x + a)^n) - (4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b*
x + a))*log((d*x + c)^n))/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*i
ntegrate(1/2*(2*b^3*d*x^3*log(e) + 2*b^3*c*x^2*log(e) - 3*a^2*b*c*n + 3*a^3
*d*n - 4*(a*b^2*c*n - a^2*b*d*n)*x - 2*(a^2*b*c*n - a^3*d*n + (b^3*c*n - a*
b^2*d*n)*x^2 + 2*(a*b^2*c*n - a^2*b*d*n)*x)*log(b*x + a))/(b^6*d*g^3*x^4 +
a^3*b^3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 + a^2*b^4*
d*g^3)*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*x), x)) - (2*b*x + a)*B*c*d*
i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a
^2*b^2*g^3) - (2*b*x + a)*A*c*d*i^2/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*
g^3) - 1/2*B*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^3*g^3*x^2 +
2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A*c^2*i^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a
^2*b*g^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^2i^2x^2 + 2\,Acdi^2x + Ac^2i^2 + \left(Bd^2i^2x^2 + 2\,Bcdi^2x + Bc^2i^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^3g^3x^3 + 3\,ab^2g^3x^2 + 3\,a^2bg^3x + a^3g^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="fricas")
```

```
[Out] integral((A*d^2*i^2*x^2 + 2*A*c*d*i^2*x + A*c^2*i^2 + (B*d^2*i^2*x^2 + 2*B*
c*d*i^2*x + B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n))/(b^3*g^3*x^3 + 3*a*b
^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g)^3, x)
```

3.124 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=93

$$-\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4(a+bx)^3(bc-ad)}-\frac{Bi^2n(c+dx)^3}{9g^4(a+bx)^3(bc-ad)}$$

```
[Out] -(B*i^2*n*(c + d*x)^3)/(9*(b*c - a*d)*g^4*(a + b*x)^3) - (i^2*(c + d*x)^3*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)*g^4*(a + b*x)^3)
```

Rubi [B] time = 0.515931, antiderivative size = 301, normalized size of antiderivative = 3.24, number of steps used = 14, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^4(a+bx)}-\frac{di^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^4(a+bx)^2}-\frac{i^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3g^4(a+bx)^3}-\frac{Bd^3i^2n\log}{3b^3g^4(b}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
4,x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2*n)/(9*b^3*g^4*(a + b*x)^3) - (B*d*(b*c - a*d)*i^2*n)/
(3*b^3*g^4*(a + b*x)^2) - (B*d^2*i^2*n)/(3*b^3*g^4*(a + b*x)) - (B*d^3*i^2*
n*Log[a + b*x])/(3*b^3*(b*c - a*d)*g^4) - ((b*c - a*d)^2*i^2*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(3*b^3*g^4*(a + b*x)^3) - (d*(b*c - a*d)*i^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^4*(a + b*x)^2) - (d^2*i^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^4*(a + b*x)) + (B*d^3*i^2*n*Log[c
+ d*x])/(3*b^3*(b*c - a*d)*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(124c+124dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}dx = \int\left(\frac{15376(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^4(a+bx)^4}+\frac{30752d(bc-ad)\left(A\right.}{b^2g^4(a}\right.$$

$$=\frac{\left(15376d^2\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}dx}{b^2g^4}+\frac{(30752d(bc-ad))\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.}{(a+bx)^3}}{b^2g^4}$$

$$=-\frac{15376(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3g^4(a+bx)^3}-\frac{15376d(bc-ad)\left(A+\right.}{b^3g^4(a+}$$

$$=-\frac{15376(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3g^4(a+bx)^3}-\frac{15376d(bc-ad)\left(A+\right.}{b^3g^4(a+}$$

$$=-\frac{15376(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^3g^4(a+bx)^3}-\frac{15376d(bc-ad)\left(A+\right.}{b^3g^4(a+}$$

$$=-\frac{15376B(bc-ad)^2n}{9b^3g^4(a+bx)^3}-\frac{15376Bd(bc-ad)n}{3b^3g^4(a+bx)^2}-\frac{15376Bd^2n}{3b^3g^4(a+bx)}-\frac{1537}{3}$$

Mathematica [B] time = 0.337913, size = 329, normalized size = 3.54

$$-\frac{i^2\left(-9a^2Abd^3x-3a^3Ad^3+3B(bc-ad)\left(a^2d^2+abd(c+3dx)+b^2\left(c^2+3cdx+3d^2x^2\right)\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-9a^2bBd^3nx\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^4,x]
```

```
[Out] -(i^2*(3*A*b^3*c^3 - 3*a^3*A*d^3 + b^3*B*c^3*n - a^3*B*d^3*n + 9*A*b^3*c^2*
d*x - 9*a^2*A*b*d^3*x + 3*b^3*B*c^2*d*n*x - 3*a^2*b*B*d^3*n*x + 9*A*b^3*c*d
^2*x^2 - 9*a*A*b^2*d^3*x^2 + 3*b^3*B*c*d^2*n*x^2 - 3*a*b^2*B*d^3*n*x^2 + 3*
B*d^3*n*(a + b*x)^3*Log[a + b*x] + 3*B*(b*c - a*d)*(a^2*d^2 + a*b*d*(c + 3*
d*x) + b^2*(c^2 + 3*c*d*x + 3*d^2*x^2))*Log[e*((a + b*x)/(c + d*x))^n] - 3*
a^3*B*d^3*n*Log[c + d*x] - 9*a^2*b*B*d^3*n*x*Log[c + d*x] - 9*a*b^2*B*d^3*n
*x^2*Log[c + d*x] - 3*b^3*B*d^3*n*x^3*Log[c + d*x]))/(9*b^3*(b*c - a*d)*g^4
*(a + b*x)^3)
```

Maple [F] time = 0.673, size = 0, normalized size = 0.

$$\int\frac{(dix+ci)^2}{(bgx+ag)^4}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

Maxima [B] time = 1.61, size = 2084, normalized size = 22.41

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="maxima")
```

```
[Out] -1/18*B*d^2*i^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2
 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*
b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2
*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*
b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^
2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3
*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3
)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g
^4)) - 1/18*B*c^2*i^2*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^
2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x
^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 -
 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*
d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2
- a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^
2*c*d^2 - a^3*b*d^3)*g^4)) - 1/18*B*c*d*i^2*n*((5*a*b^2*c^2 - 22*a^2*b*c*d
+ 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d +
 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*
c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d
 + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) -
6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*
d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*
a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/3*(3*b*x + a)*B*c*d*
i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 +
 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*B*d^2*i^2
*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*
a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/3*(3*b*x + a)*A*c*d*i^2/(b^5*g^4*x^3 + 3*a
*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x +
a^2)*A*d^2*i^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g
^4) - 1/3*B*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3
*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A*c^2*i^2/(b^4*g^4*x^3
+ 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 0.514387, size = 799, normalized size = 8.59

$$-\frac{\left(Bb^3c^3 - Ba^3d^3\right)i^2n + 3\left(Ab^3c^3 - Aa^3d^3\right)i^2 + 3\left(\left(Bb^3cd^2 - Bab^2d^3\right)i^2n + 3\left(Ab^3cd^2 - Aab^2d^3\right)i^2\right)x^2 + 3\left(\left(Bb^3c^2d - Ba^2b\right.\right.}{9\left(\left(b^7c - \right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="fricas")
```

```
[Out] -1/9*((B*b^3*c^3 - B*a^3*d^3)*i^2*n + 3*(A*b^3*c^3 - A*a^3*d^3)*i^2 + 3*((B
*b^3*c*d^2 - B*a*b^2*d^3)*i^2*n + 3*(A*b^3*c*d^2 - A*a*b^2*d^3)*i^2)*x^2 +
3*((B*b^3*c^2*d - B*a^2*b*d^3)*i^2*n + 3*(A*b^3*c^2*d - A*a^2*b*d^3)*i^2)*x
 + 3*(3*(B*b^3*c*d^2 - B*a*b^2*d^3)*i^2*x^2 + 3*(B*b^3*c^2*d - B*a^2*b*d^3)
*i^2*x + (B*b^3*c^3 - B*a^3*d^3)*i^2)*log(e) + 3*(B*b^3*d^3*i^2*n*x^3 + 3*B
*b^3*c*d^2*i^2*n*x^2 + 3*B*b^3*c^2*d*i^2*n*x + B*b^3*c^3*i^2*n)*log((b*x +
a)/(d*x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*x^2
 + 3*(a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.22472, size = 552, normalized size = 5.94

$$\frac{Bd^3n\log(bx+a)}{3\left(b^4cg^4-ab^3dg^4\right)}-\frac{Bd^3n\log(dx+c)}{3\left(b^4cg^4-ab^3dg^4\right)}+\frac{\left(3\,Bb^2d^2nx^2+3\,Bb^2cdnx+3\,Babd^2nx+Bb^2c^2n+Babcdn+Ba^2d^2n\right)\log}{3\left(b^6g^4x^3+3\,ab^5g^4x^2+3\,a^2b^4g^4x+a^3b^3g^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="giac")
```

```
[Out] 1/3*B*d^3*n*log(b*x + a)/(b^4*c*g^4 - a*b^3*d*g^4) - 1/3*B*d^3*n*log(d*x +
c)/(b^4*c*g^4 - a*b^3*d*g^4) + 1/3*(3*B*b^2*d^2*n*x^2 + 3*B*b^2*c*d*n*x + 3
*B*a*b*d^2*n*x + B*b^2*c^2*n + B*a*b*c*d*n + B*a^2*d^2*n)*log((b*x + a)/(d*
x + c))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + 1
/9*(3*B*b^2*d^2*n*x^2 + 3*B*b^2*c*d*n*x + 3*B*a*b*d^2*n*x + 9*A*b^2*d^2*x^2
 + 9*B*b^2*d^2*x^2 + B*b^2*c^2*n + B*a*b*c*d*n + B*a^2*d^2*n + 9*A*b^2*c*d*
x + 9*B*b^2*c*d*x + 9*A*a*b*d^2*x + 9*B*a*b*d^2*x + 3*A*b^2*c^2 + 3*B*b^2*c
^2 + 3*A*a*b*c*d + 3*B*a*b*c*d + 3*A*a^2*d^2 + 3*B*a^2*d^2)/(b^6*g^4*x^3 +
3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4)
```

3.125 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=189

$$-\frac{bi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^2}-\frac{bBi^2n(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^2}+\frac{Bdi^2n(c+ \ldots}{9g^5(a+bx)^3(\ldots}$$

```
[Out] (B*d*i^2*n*(c + d*x)^3)/(9*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B*i^2*n*(c +
 d*x)^4)/(16*(b*c - a*d)^2*g^5*(a + b*x)^4) + (d*i^2*(c + d*x)^3*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*i^2*(c
 + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*(b*c - a*d)^2*g^5*(a +
 b*x)^4)
```

Rubi [A] time = 0.60018, antiderivative size = 340, normalized size of antiderivative = 1.8, number of steps used = 14, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^3g^5(a+bx)^2}-\frac{2di^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3g^5(a+bx)^3}-\frac{i^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b^3g^5(a+bx)^4}+\frac{\ldots}{12b^3g^5(\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
5,x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2*n)/(16*b^3*g^5*(a + b*x)^4) - (5*B*d*(b*c - a*d)*i^2*
n)/(36*b^3*g^5*(a + b*x)^3) - (B*d^2*i^2*n)/(24*b^3*g^5*(a + b*x)^2) + (B*d
^3*i^2*n)/(12*b^3*(b*c - a*d)*g^5*(a + b*x)) + (B*d^4*i^2*n*Log[a + b*x])/(
12*b^3*(b*c - a*d)^2*g^5) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/(4*b^3*g^5*(a + b*x)^4) - (2*d*(b*c - a*d)*i^2*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(3*b^3*g^5*(a + b*x)^3) - (d^2*i^2*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(2*b^3*g^5*(a + b*x)^2) - (B*d^4*i^2*n*Log[c + d*x]
)/(12*b^3*(b*c - a*d)^2*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(125c+125dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^5}\,dx = \int\left(\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^5(a+bx)^5}+\frac{31250d(bc-ad)\left(A\right.}{b^2g^5(a\right.}$$

$$=\frac{\left(15625d^2\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^3}\,dx}{b^2g^5}+\frac{(31250d(bc-ad))\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.}{(a+bx)^4}}{b^2g^5}$$

$$=-\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3g^5(a+bx)^4}-\frac{31250d(bc-ad)\left(A+\right.}{3b^3g^5(a+}$$

$$=-\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3g^5(a+bx)^4}-\frac{31250d(bc-ad)\left(A+\right.}{3b^3g^5(a+}$$

$$=-\frac{15625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^3g^5(a+bx)^4}-\frac{31250d(bc-ad)\left(A+\right.}{3b^3g^5(a+}$$

$$=-\frac{15625B(bc-ad)^2n}{16b^3g^5(a+bx)^4}-\frac{78125Bd(bc-ad)n}{36b^3g^5(a+bx)^3}-\frac{15625Bd^2n}{24b^3g^5(a+bx)^2}+\frac{}{12}$$

Mathematica [B] time = 0.432689, size = 474, normalized size = 2.51

$$-\frac{d^2i^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^3g^5(a+bx)^2}-\frac{2di^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3g^5(a+bx)^3}-\frac{i^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4b^3g^5(a+bx)^4}-\frac{Bd^2i^2}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^5,x]
```

```
[Out] -((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^3*g^5*(a +
 b*x)^4) - (2*d*(b*c - a*d)*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*
b^3*g^5*(a + b*x)^3) - (d^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*
b^3*g^5*(a + b*x)^2) - (B*d^2*i^2*n*((a + b*x)^(-2) - (2*d)/((b*c - a*d)*(a
 + b*x)) - (2*d^2*Log[a + b*x])/(b*c - a*d)^2 + (2*d^2*Log[c + d*x])/(b*c -
 a*d)^2))/(4*b^3*g^5) - (B*d*i^2*n*((2*(b*c - a*d))/(a + b*x)^3 - (3*d)/(a
+ b*x)^2 + (6*d^2)/((b*c - a*d)*(a + b*x)) + (6*d^3*Log[a + b*x])/(b*c - a*
d)^2 - (6*d^3*Log[c + d*x])/(b*c - a*d)^2))/(9*b^3*g^5) - (B*i^2*n*((3*(b*c
 - a*d)^2)/(a + b*x)^4 - (4*d*(b*c - a*d))/(a + b*x)^3 + (6*d^2)/(a + b*x)^
2 - (12*d^3)/((b*c - a*d)*(a + b*x)) - (12*d^4*Log[a + b*x])/(b*c - a*d)^2
+ (12*d^4*Log[c + d*x])/(b*c - a*d)^2))/(48*b^3*g^5)
```

Maple [F] time = 0.688, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)}{(bgx+ag)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x)
```

Maxima [B] time = 1.95532, size = 3033, normalized size = 16.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, a
lgorithm="maxima")
```

```
[Out] 1/48*B*c^2*i^2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c
*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^
2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^
3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4
*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^
5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a
^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*
b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2
*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 -
4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/
144*B*d^2*i^2*n*((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^
5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 -
 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 -
 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9
*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*
c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7
*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^
6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c
^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^
3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4
*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*
d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4
*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/72*B*c*d*i^2*n*((7*a*b^3*c^3 - 33*a^2*b^2*c
^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(
4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3
*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*
a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a
^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*
a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3
*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^
6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6
*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g
^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2
*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) - 1/6*(4*b*x + a)*B*c*d
```

```
*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3
+ 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/12*(6*b^2*x^2 + 4*
a*b*x + a^2)*B*d^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^7*g^5*x^4
+ 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/
6*(4*b*x + a)*A*c*d*i^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2
+ 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*A*d^2*i
^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a
^4*b^3*g^5) - 1/4*B*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^5
*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) -
 1/4*A*c^2*i^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b
^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 0.558484, size = 1446, normalized size = 7.65

$$12\left(Bb^4cd^3 - Bab^3d^4\right)i^2nx^3 - \left(9\,Bb^4c^4 - 16\,Bab^3c^3d + 7\,Ba^4d^4\right)i^2n - 12\left(3\,Ab^4c^4 - 4\,Aab^3c^3d + Aa^4d^4\right)i^2 - 6\left(\left(Bb^4c^2d\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, a
lgorithm="fricas")
```

```
[Out] 1/144*(12*(B*b^4*c*d^3 - B*a*b^3*d^4)*i^2*n*x^3 - (9*B*b^4*c^4 - 16*B*a*b^3
*c^3*d + 7*B*a^4*d^4)*i^2*n - 12*(3*A*b^4*c^4 - 4*A*a*b^3*c^3*d + A*a^4*d^4
)*i^2 - 6*((B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4)*i^2*n + 12*(
A*b^4*c^2*d^2 - 2*A*a*b^3*c*d^3 + A*a^2*b^2*d^4)*i^2)*x^2 - 4*((5*B*b^4*c^3
*d - 12*B*a*b^3*c^2*d^2 + 7*B*a^3*b*d^4)*i^2*n + 12*(2*A*b^4*c^3*d - 3*A*a*
b^3*c^2*d^2 + A*a^3*b*d^4)*i^2)*x - 12*(6*(B*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3
+ B*a^2*b^2*d^4)*i^2*x^2 + 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2 + B*a^3*b*d
^4)*i^2*x + (3*B*b^4*c^4 - 4*B*a*b^3*c^3*d + B*a^4*d^4)*i^2)*log(e) + 12*(B
*b^4*d^4*i^2*n*x^4 + 4*B*a*b^3*d^4*i^2*n*x^3 - 6*(B*b^4*c^2*d^2 - 2*B*a*b^3
*c*d^3)*i^2*n*x^2 - 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2)*i^2*n*x - (3*B*b^
4*c^4 - 4*B*a*b^3*c^3*d)*i^2*n)*log((b*x + a)/(d*x + c)))/((b^9*c^2 - 2*a*b
^8*c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)
*g^5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b
^6*c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d
+ a^6*b^3*d^2)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.31058, size = 942, normalized size = 4.98

$$-\frac{Bd^4n\log(bx+a)}{12\left(b^5c^2g^5 - 2\,ab^4cdg^5 + a^2b^3d^2g^5\right)} + \frac{Bd^4n\log(dx+c)}{12\left(b^5c^2g^5 - 2\,ab^4cdg^5 + a^2b^3d^2g^5\right)} + \frac{\left(6\,Bb^2d^2nx^2 + 8\,Bb^2cdnx + 4\,Babd^2nx\right.}{12\left(b^7g^5x^4 + 4\,ab^6g^5x^3 + 6\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, a
lgorithm="giac")
```

```
[Out] -1/12*B*d^4*n*log(b*x + a)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*g^5
) + 1/12*B*d^4*n*log(d*x + c)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*
g^5) + 1/12*(6*B*b^2*d^2*n*x^2 + 8*B*b^2*c*d*n*x + 4*B*a*b*d^2*n*x + 3*B*b^
2*c^2*n + 2*B*a*b*c*d*n + B*a^2*d^2*n)*log((b*x + a)/(d*x + c))/(b^7*g^5*x^
4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) -
1/144*(12*B*b^3*d^3*n*x^3 - 6*B*b^3*c*d^2*n*x^2 + 42*B*a*b^2*d^3*n*x^2 - 20
*B*b^3*c^2*d*n*x + 28*B*a*b^2*c*d^2*n*x + 28*B*a^2*b*d^3*n*x - 72*A*b^3*c*d
^2*x^2 - 72*B*b^3*c*d^2*x^2 + 72*A*a*b^2*d^3*x^2 + 72*B*a*b^2*d^3*x^2 - 9*B
*b^3*c^3*n + 7*B*a*b^2*c^2*d*n + 7*B*a^2*b*c*d^2*n + 7*B*a^3*d^3*n - 96*A*b
^3*c^2*d*x - 96*B*b^3*c^2*d*x + 48*A*a*b^2*c*d^2*x + 48*B*a*b^2*c*d^2*x + 4
8*A*a^2*b*d^3*x + 48*B*a^2*b*d^3*x - 36*A*b^3*c^3 - 36*B*b^3*c^3 + 12*A*a*b
^2*c^2*d + 12*B*a*b^2*c^2*d + 12*A*a^2*b*c*d^2 + 12*B*a^2*b*c*d^2 + 12*A*a^
3*d^3 + 12*B*a^3*d^3)/(b^8*c*g^5*x^4 - a*b^7*d*g^5*x^4 + 4*a*b^7*c*g^5*x^3
- 4*a^2*b^6*d*g^5*x^3 + 6*a^2*b^6*c*g^5*x^2 - 6*a^3*b^5*d*g^5*x^2 + 4*a^3*b
^5*c*g^5*x - 4*a^4*b^4*d*g^5*x + a^4*b^4*c*g^5 - a^5*b^3*d*g^5)
```

3.126 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=293

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^6(a+bx)^3(bc-ad)^3}+\frac{bdi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right.}{2g^6(a+bx)^4(bc-ad)^3}$$

```
[Out] -(B*d^2*i^2*n*(c + d*x)^3)/(9*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B*d*i^2*n
*(c + d*x)^4)/(8*(b*c - a*d)^3*g^6*(a + b*x)^4) - (b^2*B*i^2*n*(c + d*x)^5)
/(25*(b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(c + d*x)^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*d*i^2*(c + d
*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^6*(a + b*x
)^4) - (b^2*i^2*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*(b*c
 - a*d)^3*g^6*(a + b*x)^5)
```

Rubi [A] time = 0.720867, antiderivative size = 375, normalized size of antiderivative = 1.28, number of steps used = 14, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3g^6(a+bx)^3}-\frac{di^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^3g^6(a+bx)^4}-\frac{i^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^3g^6(a+bx)^5}-\frac{}{30b^3g^6}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
6,x]
```

```
[Out] -(B*(b*c - a*d)^2*i^2*n)/(25*b^3*g^6*(a + b*x)^5) - (3*B*d*(b*c - a*d)*i^2*
n)/(40*b^3*g^6*(a + b*x)^4) - (B*d^2*i^2*n)/(90*b^3*g^6*(a + b*x)^3) + (B*d
^3*i^2*n)/(60*b^3*(b*c - a*d)*g^6*(a + b*x)^2) - (B*d^4*i^2*n)/(30*b^3*(b*c
 - a*d)^2*g^6*(a + b*x)) - (B*d^5*i^2*n*Log[a + b*x])/(30*b^3*(b*c - a*d)^3
*g^6) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^3*g
^6*(a + b*x)^5) - (d*(b*c - a*d)*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(2*b^3*g^6*(a + b*x)^4) - (d^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(3*b^3*g^6*(a + b*x)^3) + (B*d^5*i^2*n*Log[c + d*x])/(30*b^3*(b*c - a*d)^
3*g^6)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(126c+126dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^6}\,dx = \int \left(\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^6(a+bx)^6} + \frac{31752d(bc-ad)\left(A+B\right.}{b^2g^6(a+b}\right.$$

$$= \frac{\left(15876d^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4}\,dx}{b^2g^6} + \frac{(31752d(bc-ad))\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^5}}{b^2g^6}$$

$$= -\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b^3g^6(a+bx)^5} - \frac{7938d(bc-ad)\left(A+B\log\right.}{b^3g^6(a+bx)^4}$$

$$= -\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b^3g^6(a+bx)^5} - \frac{7938d(bc-ad)\left(A+B\log\right.}{b^3g^6(a+bx)^4}$$

$$= -\frac{15876(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b^3g^6(a+bx)^5} - \frac{7938d(bc-ad)\left(A+B\log\right.}{b^3g^6(a+bx)^4}$$

$$= -\frac{15876B(bc-ad)^2n}{25b^3g^6(a+bx)^5} - \frac{11907Bd(bc-ad)n}{10b^3g^6(a+bx)^4} - \frac{882Bd^2n}{5b^3g^6(a+bx)^3} + \frac{1}{5b^3(bc}$$

Mathematica [A] time = 1.05588, size = 357, normalized size = 1.22

$$\frac{i^2\left(-\frac{360a^2Ad^2}{(a+bx)^5} - \frac{60B\left(a^2d^2+abd(3c+5dx)+b^2\left(6c^2+15cdx+10d^2x^2\right)\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^5} - \frac{72a^2Bd^2n}{(a+bx)^5} - \frac{360Ab^2c^2}{(a+bx)^5} - \frac{900Abcd}{(a+bx)^4} + \frac{720aAbcd}{(a+bx)^5} - \frac{600Ad^2}{(a+bx)^3} + \frac{900}{(a}\right.}{1800}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^6,x]
```

```
[Out] (i^2*((-360*A*b^2*c^2)/(a + b*x)^5 + (720*a*A*b*c*d)/(a + b*x)^5 - (360*a^2
*A*d^2)/(a + b*x)^5 - (72*b^2*B*c^2*n)/(a + b*x)^5 + (144*a*b*B*c*d*n)/(a +
 b*x)^5 - (72*a^2*B*d^2*n)/(a + b*x)^5 - (900*A*b*c*d)/(a + b*x)^4 + (900*a
*A*d^2)/(a + b*x)^4 - (135*b*B*c*d*n)/(a + b*x)^4 + (135*a*B*d^2*n)/(a + b*
x)^4 - (600*A*d^2)/(a + b*x)^3 - (20*B*d^2*n)/(a + b*x)^3 + (30*B*d^3*n)/((
b*c - a*d)*(a + b*x)^2) - (60*B*d^4*n)/((b*c - a*d)^2*(a + b*x)) - (60*B*d^
5*n*Log[a + b*x])/(b*c - a*d)^3 - (60*B*(a^2*d^2 + a*b*d*(3*c + 5*d*x) + b^
2*(6*c^2 + 15*c*d*x + 10*d^2*x^2))*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x
```

```
)^5 + (60*B*d^5*n*Log[c + d*x])/(b*c - a*d)^3))/(1800*b^3*g^6)
```

Maple [F] time = 0.771, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{(bgx+ag)^6}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x)
```

Maxima [B] time = 2.28833, size = 4128, normalized size = 14.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, a
lgorithm="maxima")
```

```
[Out] -1/300*B*c^2*i^2*n*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2
*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)
*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*
c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 -
 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5
 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a
^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2
 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3
*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^
6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4
)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*
d^3 + a^9*b*d^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*
a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) -
60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3
*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6)) - 1/1800*B*d^2*i^2*n*((47
*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 +
47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10
*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*
(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 4
7*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*
d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*
a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 -
 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*
x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*
d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*
c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b
^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*
b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d
^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c
^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*
d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d
*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3
```

```
 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6)) - 1/600*B*c*d*i^2*n*((27*a*b^4*c^4
- 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 -
60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a
^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 -
 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2
 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2
*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a
^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 +
 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 +
a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^
2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3
*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^
4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^
6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2
*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 6
0*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c
^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) - 1/10*(
5*b*x + a)*B*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^7*g^6*x^5 +
5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x
 + a^5*b^2*g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*B*d^2*i^2*log(e*(b*x/(d
*x + c) + a/(d*x + c))^n)/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x
^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1/10*(5*b*x + a)
*A*c*d*i^2/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4
*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^
2)*A*d^2*i^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b
^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1/5*B*c^2*i^2*log(e*(b*x/(d*x
 + c) + a/(d*x + c))^n)/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3
 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6) - 1/5*A*c^2*i^2/(b^6*g
^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*
b^2*g^6*x + a^5*b*g^6)
```

Fricas [B] time = 0.634855, size = 2213, normalized size = 7.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, a
lgorithm="fricas")
```

```
[Out] -1/1800*(60*(B*b^5*c*d^4 - B*a*b^4*d^5)*i^2*n*x^4 - 30*(B*b^5*c^2*d^3 - 10*
B*a*b^4*c*d^4 + 9*B*a^2*b^3*d^5)*i^2*n*x^3 + (72*B*b^5*c^5 - 225*B*a*b^4*c^
4*d + 200*B*a^2*b^3*c^3*d^2 - 47*B*a^5*d^5)*i^2*n + 60*(6*A*b^5*c^5 - 15*A*
a*b^4*c^4*d + 10*A*a^2*b^3*c^3*d^2 - A*a^5*d^5)*i^2 + 10*((2*B*b^5*c^3*d^2
- 15*B*a*b^4*c^2*d^3 + 60*B*a^2*b^3*c*d^4 - 47*B*a^3*b^2*d^5)*i^2*n + 60*(A
*b^5*c^3*d^2 - 3*A*a*b^4*c^2*d^3 + 3*A*a^2*b^3*c*d^4 - A*a^3*b^2*d^5)*i^2)*
x^2 + 5*((27*B*b^5*c^4*d - 100*B*a*b^4*c^3*d^2 + 120*B*a^2*b^3*c^2*d^3 - 47
*B*a^4*b*d^5)*i^2*n + 60*(3*A*b^5*c^4*d - 8*A*a*b^4*c^3*d^2 + 6*A*a^2*b^3*c
^2*d^3 - A*a^4*b*d^5)*i^2)*x + 60*(10*(B*b^5*c^3*d^2 - 3*B*a*b^4*c^2*d^3 +
3*B*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*i^2*x^2 + 5*(3*B*b^5*c^4*d - 8*B*a*b^4*c
^3*d^2 + 6*B*a^2*b^3*c^2*d^3 - B*a^4*b*d^5)*i^2*x + (6*B*b^5*c^5 - 15*B*a*b
^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 - B*a^5*d^5)*i^2)*log(e) + 60*(B*b^5*d^5*i^
2*n*x^5 + 5*B*a*b^4*d^5*i^2*n*x^4 + 10*B*a^2*b^3*d^5*i^2*n*x^3 + 10*(B*b^5*
c^3*d^2 - 3*B*a*b^4*c^2*d^3 + 3*B*a^2*b^3*c*d^4)*i^2*n*x^2 + 5*(3*B*b^5*c^4
*d - 8*B*a*b^4*c^3*d^2 + 6*B*a^2*b^3*c^2*d^3)*i^2*n*x + (6*B*b^5*c^5 - 15*B
*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)*i^2*n)*log((b*x + a)/(d*x + c)))/((b^1
1*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10
```

```
*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b
^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3
*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^
4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b
^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**6,x)

[Out] Timed out
```

Giac [B] time = 1.33954, size = 1443, normalized size = 4.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, a
lgorithm="giac")

[Out] 1/30*B*d^5*n*log(b*x + a)/(b^6*c^3*g^6 - 3*a*b^5*c^2*d*g^6 + 3*a^2*b^4*c*d^
2*g^6 - a^3*b^3*d^3*g^6) - 1/30*B*d^5*n*log(d*x + c)/(b^6*c^3*g^6 - 3*a*b^5
*c^2*d*g^6 + 3*a^2*b^4*c*d^2*g^6 - a^3*b^3*d^3*g^6) + 1/30*(10*B*b^2*d^2*n*
x^2 + 15*B*b^2*c*d*n*x + 5*B*a*b*d^2*n*x + 6*B*b^2*c^2*n + 3*B*a*b*c*d*n +
B*a^2*d^2*n)*log((b*x + a)/(d*x + c))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a
^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/18
00*(60*B*b^4*d^4*n*x^4 - 30*B*b^4*c*d^3*n*x^3 + 270*B*a*b^3*d^4*n*x^3 + 20*
B*b^4*c^2*d^2*n*x^2 - 130*B*a*b^3*c*d^3*n*x^2 + 470*B*a^2*b^2*d^4*n*x^2 + 1
35*B*b^4*c^3*d*n*x - 365*B*a*b^3*c^2*d^2*n*x + 235*B*a^2*b^2*c*d^3*n*x + 23
5*B*a^3*b*d^4*n*x + 600*A*b^4*c^2*d^2*x^2 + 600*B*b^4*c^2*d^2*x^2 - 1200*A*
a*b^3*c*d^3*x^2 - 1200*B*a*b^3*c*d^3*x^2 + 600*A*a^2*b^2*d^4*x^2 + 600*B*a^
2*b^2*d^4*x^2 + 72*B*b^4*c^4*n - 153*B*a*b^3*c^3*d*n + 47*B*a^2*b^2*c^2*d^2
*n + 47*B*a^3*b*c*d^3*n + 47*B*a^4*d^4*n + 900*A*b^4*c^3*d*x + 900*B*b^4*c^
3*d*x - 1500*A*a*b^3*c^2*d^2*x - 1500*B*a*b^3*c^2*d^2*x + 300*A*a^2*b^2*c*d
^3*x + 300*B*a^2*b^2*c*d^3*x + 300*A*a^3*b*d^4*x + 300*B*a^3*b*d^4*x + 360*
A*b^4*c^4 + 360*B*b^4*c^4 - 540*A*a*b^3*c^3*d - 540*B*a*b^3*c^3*d + 60*A*a^
2*b^2*c^2*d^2 + 60*B*a^2*b^2*c^2*d^2 + 60*A*a^3*b*c*d^3 + 60*B*a^3*b*c*d^3
+ 60*A*a^4*d^4 + 60*B*a^4*d^4)/(b^10*c^2*g^6*x^5 - 2*a*b^9*c*d*g^6*x^5 + a^
2*b^8*d^2*g^6*x^5 + 5*a*b^9*c^2*g^6*x^4 - 10*a^2*b^8*c*d*g^6*x^4 + 5*a^3*b^
7*d^2*g^6*x^4 + 10*a^2*b^8*c^2*g^6*x^3 - 20*a^3*b^7*c*d*g^6*x^3 + 10*a^4*b^
6*d^2*g^6*x^3 + 10*a^3*b^7*c^2*g^6*x^2 - 20*a^4*b^6*c*d*g^6*x^2 + 10*a^5*b^
5*d^2*g^6*x^2 + 5*a^4*b^6*c^2*g^6*x - 10*a^5*b^5*c*d*g^6*x + 5*a^6*b^4*d^2*
g^6*x + a^5*b^5*c^2*g^6 - 2*a^6*b^4*c*d*g^6 + a^7*b^3*d^2*g^6)
```

3.127 $\int (ag+bgx)^3(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=477

$$-\frac{b^2g^3i^3(c+dx)^6(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^4}+\frac{b^3g^3i^3(c+dx)^7\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{7d^4}-\frac{g^3i^3(c+dx)^4(bc-ad)^3\left(B\right.}{4d^4}$$

```
[Out] (B*(b*c - a*d)^6*g^3*i^3*n*x)/(140*b^3*d^3) + (B*(b*c - a*d)^5*g^3*i^3*n*(c
 + d*x)^2)/(280*b^2*d^4) + (B*(b*c - a*d)^4*g^3*i^3*n*(c + d*x)^3)/(420*b*d
^4) - (17*B*(b*c - a*d)^3*g^3*i^3*n*(c + d*x)^4)/(280*d^4) + (b*B*(b*c - a*
d)^2*g^3*i^3*n*(c + d*x)^5)/(14*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*n*(c + d*
x)^6)/(42*d^4) - ((b*c - a*d)^3*g^3*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(4*d^4) + (3*b*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(5*d^4) - (b^2*(b*c - a*d)*g^3*i^3*(c + d*x)
^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^4) + (b^3*g^3*i^3*(c + d*x)
^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(7*d^4) + (B*(b*c - a*d)^7*g^3*i
^3*n*Log[(a + b*x)/(c + d*x)])/(140*b^4*d^4) + (B*(b*c - a*d)^7*g^3*i^3*n*L
og[c + d*x])/(140*b^4*d^4)
```

Rubi [A] time = 0.991502, antiderivative size = 435, normalized size of antiderivative = 0.91, number of steps used = 18, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {2528, 2525, 12, 43}

$$\frac{d^2g^3i^3(a+bx)^6(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4}+\frac{d^3g^3i^3(a+bx)^7\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{7b^4}+\frac{g^3i^3(a+bx)^4(bc-ad)^3\left(B\right.}{4b^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] -(B*(b*c - a*d)^6*g^3*i^3*n*x)/(140*b^3*d^3) + (B*(b*c - a*d)^5*g^3*i^3*n*(
a + b*x)^2)/(280*b^4*d^2) - (B*(b*c - a*d)^4*g^3*i^3*n*(a + b*x)^3)/(420*b^
4*d) - (17*B*(b*c - a*d)^3*g^3*i^3*n*(a + b*x)^4)/(280*b^4) - (B*d*(b*c - a
*d)^2*g^3*i^3*n*(a + b*x)^5)/(14*b^4) - (B*d^2*(b*c - a*d)*g^3*i^3*n*(a + b
*x)^6)/(42*b^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(4*b^4) + (3*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(5*b^4) + (d^2*(b*c - a*d)*g^3*i^3*(a + b*x
)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4) + (d^3*g^3*i^3*(a + b*x
)^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(7*b^4) + (B*(b*c - a*d)^7*g^3*
i^3*n*Log[c + d*x])/(140*b^4*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
```

```
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (127c+127dx)^3(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx=\int\left(\frac{(-bc+ad)^3g^3(127c+127dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{d^3}\right.$$

$$=\frac{\left(b^3g^3\right)\int(127c+127dx)^6\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{2048383d^3}-$$

$$=-\frac{2048383(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{4d^4}$$

$$=-\frac{2048383(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{4d^4}$$

$$=-\frac{2048383(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{4d^4}$$

$$=\frac{2048383B(bc-ad)^6g^3nx}{140b^3d^3}+\frac{2048383B(bc-ad)^5g^3n(c}{280b^2d^4}$$

Mathematica [A] time = 0.587502, size = 631, normalized size = 1.32

$$\frac{g^3i^3\left(120d^7(a+bx)^7\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+420d^6(a+bx)^6(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+504d^5(a+bx)^5(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^3*i^3*(210*d^4*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 504*d^5*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 420*d^6*(b*c - a*d)*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]) + 120*d^7*(a + b*x)^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 35*B*(
b*c - a*d)^4*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 +
2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 42*B*(b*c - a*d)^3*n*(1
```

```
2*b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)
*(a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) - 7*B*(b*
c - a*d)^2*n*(60*b*d*(b*c - a*d)^4*x + 30*d^2*(-(b*c) + a*d)^3*(a + b*x)^2
+ 20*d^3*(b*c - a*d)^2*(a + b*x)^3 + 15*d^4*(-(b*c) + a*d)*(a + b*x)^4 + 12
*d^5*(a + b*x)^5 - 60*(b*c - a*d)^5*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(60*b
*d*(b*c - a*d)^5*x - 30*d^2*(b*c - a*d)^4*(a + b*x)^2 + 20*d^3*(b*c - a*d)^
3*(a + b*x)^3 - 15*d^4*(b*c - a*d)^2*(a + b*x)^4 + 12*d^5*(b*c - a*d)*(a +
b*x)^5 - 10*d^6*(a + b*x)^6 - 60*(b*c - a*d)^6*Log[c + d*x])))/(840*b^4*d^4
)
```

Maple [F] time = 0.678, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3} \left(dix+ci\right)^{3} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.60214, size = 3916, normalized size = 8.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

```
[Out] 1/7*B*b^3*d^3*g^3*i^3*x^7*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/7*A*b^
3*d^3*g^3*i^3*x^7 + 1/2*B*b^3*c*d^2*g^3*i^3*x^6*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n) + 1/2*B*a*b^2*d^3*g^3*i^3*x^6*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) + 1/2*A*b^3*c*d^2*g^3*i^3*x^6 + 1/2*A*a*b^2*d^3*g^3*i^3*x^6 + 3/5*B*b
^3*c^2*d*g^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 9/5*B*a*b^2*c
*d^2*g^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/5*B*a^2*b*d^3*g
^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/5*A*b^3*c^2*d*g^3*i^3
*x^5 + 9/5*A*a*b^2*c*d^2*g^3*i^3*x^5 + 3/5*A*a^2*b*d^3*g^3*i^3*x^5 + 1/4*B*
b^3*c^3*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 9/4*B*a*b^2*c^
2*d*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 9/4*B*a^2*b*c*d^2*
g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*B*a^3*d^3*g^3*i^3*
x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b^3*c^3*g^3*i^3*x^4 + 9/
4*A*a*b^2*c^2*d*g^3*i^3*x^4 + 9/4*A*a^2*b*c*d^2*g^3*i^3*x^4 + 1/4*A*a^3*d^3
*g^3*i^3*x^4 + B*a*b^2*c^3*g^3*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n) + 3*B*a^2*b*c^2*d*g^3*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + B
*a^3*c*d^2*g^3*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*b^2*c^3
*g^3*i^3*x^3 + 3*A*a^2*b*c^2*d*g^3*i^3*x^3 + A*a^3*c*d^2*g^3*i^3*x^3 + 3/2*
B*a^2*b*c^3*g^3*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*B*a^3*
c^2*d*g^3*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*a^2*b*c^3*
g^3*i^3*x^2 + 3/2*A*a^3*c^2*d*g^3*i^3*x^2 + 1/420*B*b^3*d^3*g^3*i^3*n*(60*a
^7*log(b*x + a)/b^7 - 60*c^7*log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6)
*x^6 - 12*(b^6*c^2*d^4 - a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*
x^4 - 20*(b^6*c^4*d^2 - a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 -
 60*(b^6*c^6 - a^6*d^6)*x)/(b^6*d^6)) - 1/120*B*b^3*c*d^2*g^3*i^3*n*(60*a^6
```

```
*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x
^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^
3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) -
 1/120*B*a*b^2*d^3*g^3*i^3*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)
/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4
 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60
*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) + 1/20*B*b^3*c^2*d*g^3*i^3*n*(12*a^5*log
(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 -
4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4
*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 3/20*B*a*b^2*c*d^2*g^3*i^3*n*(12*a^5*log(b*
x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(
b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^
4 - a^4*d^4)*x)/(b^4*d^4)) + 1/20*B*a^2*b*d^3*g^3*i^3*n*(12*a^5*log(b*x + a
)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c
^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a
^4*d^4)*x)/(b^4*d^4)) - 1/24*B*b^3*c^3*g^3*i^3*n*(6*a^4*log(b*x + a)/b^4 -
6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^
2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 3/8*B*a*b^2*c^2*d*g^3*
i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*
b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^
3*d^3)) - 3/8*B*a^2*b*c*d^2*g^3*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d
*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^
2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/24*B*a^3*d^3*g^3*i^3*n*(6*a^4*l
og(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 -
 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*
B*a*b^2*c^3*g^3*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 3/2*B*a^2*b*
c^2*d*g^3*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/2*B*a^3*c*d^2*g^
3*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*
d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3/2*B*a^2*b*c^3*g^3*i^3*n*
(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 3/2*B
*a^3*c^2*d*g^3*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c -
a*d)*x/(b*d)) + B*a^3*c^3*g^3*i^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) +
 B*a^3*c^3*g^3*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a^3*c^3*g^3
*i^3*x
```

Fricas [B] time = 1.83033, size = 2716, normalized size = 5.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] 1/840*(120*A*b^7*d^7*g^3*i^3*x^7 + 6*(35*B*a^4*b^3*c^3*d^4 - 21*B*a^5*b^2*c
^2*d^5 + 7*B*a^6*b*c*d^6 - B*a^7*d^7)*g^3*i^3*n*log(b*x + a) + 6*(B*b^7*c^7
 - 7*B*a*b^6*c^6*d + 21*B*a^2*b^5*c^5*d^2 - 35*B*a^3*b^4*c^4*d^3)*g^3*i^3*n
*log(d*x + c) - 20*((B*b^7*c*d^6 - B*a*b^6*d^7)*g^3*i^3*n - 21*(A*b^7*c*d^6
 + A*a*b^6*d^7)*g^3*i^3)*x^6 - 12*(5*(B*b^7*c^2*d^5 - B*a^2*b^5*d^7)*g^3*i^
3*n - 42*(A*b^7*c^2*d^5 + 3*A*a*b^6*c*d^6 + A*a^2*b^5*d^7)*g^3*i^3)*x^5 - 3
*((17*B*b^7*c^3*d^4 + 49*B*a*b^6*c^2*d^5 - 49*B*a^2*b^5*c*d^6 - 17*B*a^3*b^
4*d^7)*g^3*i^3*n - 70*(A*b^7*c^3*d^4 + 9*A*a*b^6*c^2*d^5 + 9*A*a^2*b^5*c*d^
6 + A*a^3*b^4*d^7)*g^3*i^3)*x^4 - 2*((B*b^7*c^4*d^3 + 98*B*a*b^6*c^3*d^4 -
98*B*a^3*b^4*c*d^6 - B*a^4*b^3*d^7)*g^3*i^3*n - 420*(A*a*b^6*c^3*d^4 + 3*A*
a^2*b^5*c^2*d^5 + A*a^3*b^4*c*d^6)*g^3*i^3)*x^3 + 3*((B*b^7*c^5*d^2 - 7*B*a
```

```
*b^6*c^4*d^3 - 84*B*a^2*b^5*c^3*d^4 + 84*B*a^3*b^4*c^2*d^5 + 7*B*a^4*b^3*c*
d^6 - B*a^5*b^2*d^7)*g^3*i^3*n + 420*(A*a^2*b^5*c^3*d^4 + A*a^3*b^4*c^2*d^5
)*g^3*i^3)*x^2 + 6*(140*A*a^3*b^4*c^3*d^4*g^3*i^3 - (B*b^7*c^6*d - 7*B*a*b^
6*c^5*d^2 + 21*B*a^2*b^5*c^4*d^3 - 21*B*a^4*b^3*c^2*d^5 + 7*B*a^5*b^2*c*d^6
 - B*a^6*b*d^7)*g^3*i^3*n)*x + 6*(20*B*b^7*d^7*g^3*i^3*x^7 + 140*B*a^3*b^4*
c^3*d^4*g^3*i^3*x + 70*(B*b^7*c*d^6 + B*a*b^6*d^7)*g^3*i^3*x^6 + 84*(B*b^7*
c^2*d^5 + 3*B*a*b^6*c*d^6 + B*a^2*b^5*d^7)*g^3*i^3*x^5 + 35*(B*b^7*c^3*d^4
+ 9*B*a*b^6*c^2*d^5 + 9*B*a^2*b^5*c*d^6 + B*a^3*b^4*d^7)*g^3*i^3*x^4 + 140*
(B*a*b^6*c^3*d^4 + 3*B*a^2*b^5*c^2*d^5 + B*a^3*b^4*c*d^6)*g^3*i^3*x^3 + 210
*(B*a^2*b^5*c^3*d^4 + B*a^3*b^4*c^2*d^5)*g^3*i^3*x^2)*log(e) + 6*(20*B*b^7*
d^7*g^3*i^3*n*x^7 + 140*B*a^3*b^4*c^3*d^4*g^3*i^3*n*x + 70*(B*b^7*c*d^6 + B
*a*b^6*d^7)*g^3*i^3*n*x^6 + 84*(B*b^7*c^2*d^5 + 3*B*a*b^6*c*d^6 + B*a^2*b^5
*d^7)*g^3*i^3*n*x^5 + 35*(B*b^7*c^3*d^4 + 9*B*a*b^6*c^2*d^5 + 9*B*a^2*b^5*c
*d^6 + B*a^3*b^4*d^7)*g^3*i^3*n*x^4 + 140*(B*a*b^6*c^3*d^4 + 3*B*a^2*b^5*c^
2*d^5 + B*a^3*b^4*c*d^6)*g^3*i^3*n*x^3 + 210*(B*a^2*b^5*c^3*d^4 + B*a^3*b^4
*c^2*d^5)*g^3*i^3*n*x^2)*log((b*x + a)/(d*x + c)))/(b^4*d^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] Timed out
```

3.128 $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=387

$$\frac{b^2g^2i^3(c+dx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6d^3}+\frac{g^2i^3(c+dx)^4(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^3}-\frac{2bg^2i^3(c+dx)^5(bc-ad)}{5d}$$

```
[Out] -(B*(b*c - a*d)^5*g^2*i^3*n*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*n*(c
 + d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*n*(c + d*x)^3)/(180*b*d
^3) + (7*B*(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d
)*g^2*i^3*n*(c + d*x)^5)/(30*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c +
 d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^3) + (b^2*g^2*i^3*(c +
 d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^3) - (B*(b*c - a*d)^6*
g^2*i^3*n*Log[(a + b*x)/(c + d*x)])/(60*b^4*d^3) - (B*(b*c - a*d)^6*g^2*i^3
*n*Log[c + d*x])/(60*b^4*d^3)
```

Rubi [A] time = 0.699664, antiderivative size = 345, normalized size of antiderivative = 0.89, number of steps used = 14, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {2528, 2525, 12, 43}

$$\frac{b^2g^2i^3(c+dx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6d^3}+\frac{g^2i^3(c+dx)^4(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^3}-\frac{2bg^2i^3(c+dx)^5(bc-ad)}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),
x]
```

```
[Out] -(B*(b*c - a*d)^5*g^2*i^3*n*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*n*(c
 + d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*n*(c + d*x)^3)/(180*b*d
^3) + (7*B*(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d
)*g^2*i^3*n*(c + d*x)^5)/(30*d^3) - (B*(b*c - a*d)^6*g^2*i^3*n*Log[a + b*x]
)/(60*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(6*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (128c+128dx)^3(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int\left(\frac{(-bc+ad)^2g^2(128c+128dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d^2}\right.$$

$$=\frac{\left(b^2g^2\right)\int(128c+128dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{16384d^2}-$$

$$=\frac{524288(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d^3}-$$

$$=\frac{524288(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d^3}-$$

$$=\frac{524288(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d^3}-$$

$$=-\frac{524288B(bc-ad)^5g^2nx}{15b^3d^2}-\frac{262144B(bc-ad)^4g^2n(c+dx)}{15b^2d^3}$$

Mathematica [A] time = 0.345287, size = 441, normalized size = 1.14

$$\frac{g^2i^3\left(60b^6(c+dx)^6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-144b^5(c+dx)^5(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+90b^4(c+dx)^4(bc-ad)^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]),x]
```

```
[Out] (g^2*i^3*(-15*B*(b*c - a*d)^3*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*
(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 12*B*(b*c
 - a*d)^2*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b
^3*(b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b
*x]) - B*(b*c - a*d)*n*(60*b*d*(b*c - a*d)^4*x + 30*b^2*(b*c - a*d)^3*(c +
d*x)^2 + 20*b^3*(b*c - a*d)^2*(c + d*x)^3 + 15*b^4*(b*c - a*d)*(c + d*x)^4
+ 12*b^5*(c + d*x)^5 + 60*(b*c - a*d)^5*Log[a + b*x]) + 90*b^4*(b*c - a*d)^
2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*b^5*(b*c - a*d)*
(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 60*b^6*(c + d*x)^6*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])))/(360*b^4*d^3)
```

Maple [F] time = 0.688, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2} \left(dix+ci\right)^{3} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.53378, size = 2670, normalized size = 6.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

```
[Out] 1/6*B*b^2*d^3*g^2*i^3*x^6*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/6*A*b^
2*d^3*g^2*i^3*x^6 + 3/5*B*b^2*c*d^2*g^2*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n) + 2/5*B*a*b*d^3*g^2*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 3/5*A*b^2*c*d^2*g^2*i^3*x^5 + 2/5*A*a*b*d^3*g^2*i^3*x^5 + 3/4*B*b^2*c
^2*d*g^2*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*B*a*b*c*d^2*g
^2*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*B*a^2*d^3*g^2*i^3*x
^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/4*A*b^2*c^2*d*g^2*i^3*x^4 + 3
/2*A*a*b*c*d^2*g^2*i^3*x^4 + 1/4*A*a^2*d^3*g^2*i^3*x^4 + 1/3*B*b^2*c^3*g^2*
i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*B*a*b*c^2*d*g^2*i^3*x^3*
log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + B*a^2*c*d^2*g^2*i^3*x^3*log(e*(b*x
/(d*x + c) + a/(d*x + c))^n) + 1/3*A*b^2*c^3*g^2*i^3*x^3 + 2*A*a*b*c^2*d*g^
2*i^3*x^3 + A*a^2*c*d^2*g^2*i^3*x^3 + B*a*b*c^3*g^2*i^3*x^2*log(e*(b*x/(d*x
 + c) + a/(d*x + c))^n) + 3/2*B*a^2*c^2*d*g^2*i^3*x^2*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n) + A*a*b*c^3*g^2*i^3*x^2 + 3/2*A*a^2*c^2*d*g^2*i^3*x^2 - 1
/360*B*b^2*d^3*g^2*i^3*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6
 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 2
0*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^
5*c^5 - a^5*d^5)*x)/(b^5*d^5)) + 1/20*B*b^2*c*d^2*g^2*i^3*n*(12*a^5*log(b*x
 + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b
^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4
 - a^4*d^4)*x)/(b^4*d^4)) + 1/30*B*a*b*d^3*g^2*i^3*n*(12*a^5*log(b*x + a)/b
^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*
d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*
d^4)*x)/(b^4*d^4)) - 1/8*B*b^2*c^2*d*g^2*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*
c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*
b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/4*B*a*b*c*d^2*g^2*i^3*
n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*
d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^
3)) - 1/24*B*a^2*d^3*g^2*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)
/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(
b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/6*B*b^2*c^3*g^2*i^3*n*(2*a^3*log(b*x +
 a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2)) + B*a*b*c^2*d*g^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*
c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/
(b^2*d^2)) + 1/2*B*a^2*c*d^2*g^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(
```

```
d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2
)) - B*a*b*c^3*g^2*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*
c - a*d)*x/(b*d)) - 3/2*B*a^2*c^2*d*g^2*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*l
og(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^2*c^3*g^2*i^3*n*(a*log(b*x + a
)/b - c*log(d*x + c)/d) + B*a^2*c^3*g^2*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + A*a^2*c^3*g^2*i^3*x
```

Fricas [B] time = 1.15396, size = 2202, normalized size = 5.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] 1/360*(60*A*b^6*d^6*g^2*i^3*x^6 + 6*(20*B*a^3*b^3*c^3*d^3 - 15*B*a^4*b^2*c^
2*d^4 + 6*B*a^5*b*c*d^5 - B*a^6*d^6)*g^2*i^3*n*log(b*x + a) - 6*(B*b^6*c^6
- 6*B*a*b^5*c^5*d + 15*B*a^2*b^4*c^4*d^2)*g^2*i^3*n*log(d*x + c) - 12*((B*b
^6*c*d^5 - B*a*b^5*d^6)*g^2*i^3*n - 6*(3*A*b^6*c*d^5 + 2*A*a*b^5*d^6)*g^2*i
^3)*x^5 - 3*((13*B*b^6*c^2*d^4 - 6*B*a*b^5*c*d^5 - 7*B*a^2*b^4*d^6)*g^2*i^3
*n - 30*(3*A*b^6*c^2*d^4 + 6*A*a*b^5*c*d^5 + A*a^2*b^4*d^6)*g^2*i^3)*x^4 -
2*((19*B*b^6*c^3*d^3 + 21*B*a*b^5*c^2*d^4 - 39*B*a^2*b^4*c*d^5 - B*a^3*b^3*
d^6)*g^2*i^3*n - 60*(A*b^6*c^3*d^3 + 6*A*a*b^5*c^2*d^4 + 3*A*a^2*b^4*c*d^5)
*g^2*i^3)*x^3 - 3*((B*b^6*c^4*d^2 + 34*B*a*b^5*c^3*d^3 - 30*B*a^2*b^4*c^2*d
^4 - 6*B*a^3*b^3*c*d^5 + B*a^4*b^2*d^6)*g^2*i^3*n - 60*(2*A*a*b^5*c^3*d^3 +
 3*A*a^2*b^4*c^2*d^4)*g^2*i^3)*x^2 + 6*(60*A*a^2*b^4*c^3*d^3*g^2*i^3 + (B*b
^6*c^5*d - 6*B*a*b^5*c^4*d^2 - 5*B*a^2*b^4*c^3*d^3 + 15*B*a^3*b^3*c^2*d^4 -
 6*B*a^4*b^2*c*d^5 + B*a^5*b*d^6)*g^2*i^3*n)*x + 6*(10*B*b^6*d^6*g^2*i^3*x^
6 + 60*B*a^2*b^4*c^3*d^3*g^2*i^3*x + 12*(3*B*b^6*c*d^5 + 2*B*a*b^5*d^6)*g^2
*i^3*x^5 + 15*(3*B*b^6*c^2*d^4 + 6*B*a*b^5*c*d^5 + B*a^2*b^4*d^6)*g^2*i^3*x
^4 + 20*(B*b^6*c^3*d^3 + 6*B*a*b^5*c^2*d^4 + 3*B*a^2*b^4*c*d^5)*g^2*i^3*x^3
 + 30*(2*B*a*b^5*c^3*d^3 + 3*B*a^2*b^4*c^2*d^4)*g^2*i^3*x^2)*log(e) + 6*(10
*B*b^6*d^6*g^2*i^3*n*x^6 + 60*B*a^2*b^4*c^3*d^3*g^2*i^3*n*x + 12*(3*B*b^6*c
*d^5 + 2*B*a*b^5*d^6)*g^2*i^3*n*x^5 + 15*(3*B*b^6*c^2*d^4 + 6*B*a*b^5*c*d^5
 + B*a^2*b^4*d^6)*g^2*i^3*n*x^4 + 20*(B*b^6*c^3*d^3 + 6*B*a*b^5*c^2*d^4 + 3
*B*a^2*b^4*c*d^5)*g^2*i^3*n*x^3 + 30*(2*B*a*b^5*c^3*d^3 + 3*B*a^2*b^4*c^2*d
^4)*g^2*i^3*n*x^2)*log((b*x + a)/(d*x + c)))/(b^4*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="giac")
```

```
[Out] Timed out
```

3.129 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=283

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^2}+\frac{bgi^3(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^2}+\frac{Bgi^3n(c+dx)^2(bc-ad)^3}{40b^2d^2}+\frac{Bg}{}$$

```
[Out] (B*(b*c - a*d)^4*g*i^3*n*x)/(20*b^3*d) + (B*(b*c - a*d)^3*g*i^3*n*(c + d*x)
^2)/(40*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*n*(c + d*x)^3)/(60*b*d^2) - (B*(b
*c - a*d)*g*i^3*n*(c + d*x)^4)/(20*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^2) + (B*(b*c - a*d)^5*g*i^3*n*Log[(a
 + b*x)/(c + d*x)])/(20*b^4*d^2) + (B*(b*c - a*d)^5*g*i^3*n*Log[c + d*x])/(
20*b^4*d^2)
```

Rubi [A] time = 0.381663, antiderivative size = 243, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 43}

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d^2}+\frac{bgi^3(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d^2}+\frac{Bgi^3n(c+dx)^2(bc-ad)^3}{40b^2d^2}+\frac{Bg}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*(b*c - a*d)^4*g*i^3*n*x)/(20*b^3*d) + (B*(b*c - a*d)^3*g*i^3*n*(c + d*x)
^2)/(40*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*n*(c + d*x)^3)/(60*b*d^2) - (B*(b
*c - a*d)*g*i^3*n*(c + d*x)^4)/(20*d^2) + (B*(b*c - a*d)^5*g*i^3*n*Log[a +
b*x])/(20*b^4*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(5*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (129c+129dx)^3(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx=\int\left(\frac{(-bc+ad)g(129c+129dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d}\right.$$

$$=\frac{(bg)\int(129c+129dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{129d}+\frac{((\cdot}{}$$

$$=-\frac{2146689(bc-ad)g(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4d^2}+$$

$$=-\frac{2146689(bc-ad)g(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4d^2}+$$

$$=-\frac{2146689(bc-ad)g(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4d^2}+$$

$$=\frac{2146689B(bc-ad)^4gnx}{20b^3d}+\frac{2146689B(bc-ad)^3gn(c+d}{40b^2d^2}$$

Mathematica [A] time = 0.214849, size = 269, normalized size = 0.95

$$\frac{gi^3\left(24b(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-30(c+dx)^4(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+\frac{5Bn(bc-ad)^2\left(3b^2(c+dx)^2(bc-ad)+6\right.}{}\right.}{12}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]),x]
```

```
[Out] (g*i^3*((5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c
+ d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/b^4 - (2*B*(b
*c - a*d)*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b
^3*(b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b
*x]))/b^4 - 30*(b*c - a*d)*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) + 24*b*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(120*d^2)
```

Maple [F] time = 0.536, size = 0, normalized size = 0.

$$\int(bgx+ag)(dix+ci)^3\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.50127, size = 1509, normalized size = 5.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="maxima")
```

```
[Out] 1/5*B*b*d^3*g*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A*b*d^3*
g*i^3*x^5 + 3/4*B*b*c*d^2*g*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
+ 1/4*B*a*d^3*g*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/4*A*b*c*
d^2*g*i^3*x^4 + 1/4*A*a*d^3*g*i^3*x^4 + B*b*c^2*d*g*i^3*x^3*log(e*(b*x/(d*x
 + c) + a/(d*x + c))^n) + B*a*c*d^2*g*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + A*b*c^2*d*g*i^3*x^3 + A*a*c*d^2*g*i^3*x^3 + 1/2*B*b*c^3*g*i^3*x
^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*B*a*c^2*d*g*i^3*x^2*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*b*c^3*g*i^3*x^2 + 3/2*A*a*c^2*d*g*i
^3*x^2 + 1/60*B*b*d^3*g*i^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c
)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3
+ 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/
8*B*b*c*d^2*g*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(
b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a
^3*d^3)*x)/(b^3*d^3)) - 1/24*B*a*d^3*g*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^
4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*B*b*c^2*d*g*i^3*n*(2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/2*B*a*c*d^2*g*i^3*n*(2*a^3*log(b*x +
 a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2)) - 1/2*B*b*c^3*g*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*lo
g(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 3/2*B*a*c^2*d*g*i^3*n*(a^2*log(b*x
+ a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a*c^3*g*i^3*n*(a
*log(b*x + a)/b - c*log(d*x + c)/d) + B*a*c^3*g*i^3*x*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n) + A*a*c^3*g*i^3*x
```

Fricas [B] time = 0.796294, size = 1501, normalized size = 5.3

$$24\,Ab^5d^5gi^3x^5 + 6\left(10\,Ba^2b^3c^3d^2 - 10\,Ba^3b^2c^2d^3 + 5\,Ba^4bcd^4 - Ba^5d^5\right)gi^3n\log\left(bx + a\right) + 6\left(Bb^5c^5 - 5\,Bab^4c^4d\right)gi^3n\log($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] 1/120*(24*A*b^5*d^5*g*i^3*x^5 + 6*(10*B*a^2*b^3*c^3*d^2 - 10*B*a^3*b^2*c^2*
d^3 + 5*B*a^4*b*c*d^4 - B*a^5*d^5)*g*i^3*n*log(b*x + a) + 6*(B*b^5*c^5 - 5*
B*a*b^4*c^4*d)*g*i^3*n*log(d*x + c) - 6*((B*b^5*c*d^4 - B*a*b^4*d^5)*g*i^3*
n - 5*(3*A*b^5*c*d^4 + A*a*b^4*d^5)*g*i^3)*x^4 - 2*((11*B*b^5*c^2*d^3 - 10*
B*a*b^4*c*d^4 - B*a^2*b^3*d^5)*g*i^3*n - 60*(A*b^5*c^2*d^3 + A*a*b^4*c*d^4)
*g*i^3)*x^3 - 3*((9*B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 - 5*B*a^2*b^3*c*d^4 +
```

```
 B*a^3*b^2*d^5)*g*i^3*n - 20*(A*b^5*c^3*d^2 + 3*A*a*b^4*c^2*d^3)*g*i^3)*x^2
 + 6*(20*A*a*b^4*c^3*d^2*g*i^3 - (B*b^5*c^4*d + 5*B*a*b^4*c^3*d^2 - 10*B*a^
2*b^3*c^2*d^3 + 5*B*a^3*b^2*c*d^4 - B*a^4*b*d^5)*g*i^3*n)*x + 6*(4*B*b^5*d^
5*g*i^3*x^5 + 20*B*a*b^4*c^3*d^2*g*i^3*x + 5*(3*B*b^5*c*d^4 + B*a*b^4*d^5)*
g*i^3*x^4 + 20*(B*b^5*c^2*d^3 + B*a*b^4*c*d^4)*g*i^3*x^3 + 10*(B*b^5*c^3*d^
2 + 3*B*a*b^4*c^2*d^3)*g*i^3*x^2)*log(e) + 6*(4*B*b^5*d^5*g*i^3*n*x^5 + 20*
B*a*b^4*c^3*d^2*g*i^3*n*x + 5*(3*B*b^5*c*d^4 + B*a*b^4*d^5)*g*i^3*n*x^4 + 2
0*(B*b^5*c^2*d^3 + B*a*b^4*c*d^4)*g*i^3*n*x^3 + 10*(B*b^5*c^3*d^2 + 3*B*a*b
^4*c^2*d^3)*g*i^3*n*x^2)*log((b*x + a)/(d*x + c)))/(b^4*d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="giac")
```

```
[Out] Timed out
```

3.130 $\int (ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=156

$$\frac{i^3(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d}-\frac{Bi^3nx(bc-ad)^3}{4b^3}-\frac{Bi^3n(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bi^3n(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bi^3n(c\cdots}{}$$

```
[Out] -(B*(b*c - a*d)^3*i^3*n*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2)/(8
*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3
*n*Log[a + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*d)
```

Rubi [A] time = 0.0859817, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

$$\frac{i^3(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d}-\frac{Bi^3nx(bc-ad)^3}{4b^3}-\frac{Bi^3n(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bi^3n(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bi^3n(c\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```


```
[Out] -(B*(b*c - a*d)^3*i^3*n*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2)/(8
*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3
*n*Log[a + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*d)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (130c+130dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{549250(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(Bn)\int\frac{285610000(bc-ad)(}{a+bx}}{520d}$$
$$= \frac{549250(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - \frac{(549250B(bc-ad)n)}{d}$$
$$= \frac{549250(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d} - (549250B(bc-ad)n)$$
$$= -\frac{549250B(bc-ad)^3nx}{b^3} - \frac{274625B(bc-ad)^2n(c+dx)^2}{b^2d} - 549250$$

Mathematica [A] time = 0.0730872, size = 124, normalized size = 0.79

$$\frac{i^3\left((c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)\left(3b^2(c+dx)^2(bc-ad)+6bdx(bc-ad)^2+6(bc-ad)^3\log(a+bx)+2b^3(c+dx)^3\right)}{6b^4}\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (i^3*(-(B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x
)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/(6*b^4) + (c + d*x
)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(4*d)
```

Maple [F] time = 0.498, size = 0, normalized size = 0.

$$\int (dix+ci)^3\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.40797, size = 647, normalized size = 4.15

$$\frac{1}{4}Bd^3i^3x^4\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{4}Ad^3i^3x^4+Bcd^2i^3x^3\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+Acd^2i^3x^3+\frac{3}{2}Bc^2di^3x^2\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] 1/4*B*d^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*d^3*i^3*x^
4 + B*c*d^2*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c*d^2*i^3*x^
```

```
3 + 3/2*B*c^2*d*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*c^2*
d*i^3*x^2 - 1/24*B*d^3*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d
^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^
3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*B*c*d^2*i^3*n*(2*a^3*log(b*x + a)/b^3
- 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)
*x)/(b^2*d^2)) - 3/2*B*c^2*d*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)
/d^2 + (b*c - a*d)*x/(b*d)) + B*c^3*i^3*n*(a*log(b*x + a)/b - c*log(d*x + c
)/d) + B*c^3*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c^3*i^3*x
```

Fricas [B] time = 0.635179, size = 883, normalized size = 5.66

$$\frac{6\,Ab^4d^4i^3x^4 - 6\,Bb^4c^4i^3n\log\left(dx + c\right) + 6\left(4\,Bab^3c^3d - 6\,Ba^2b^2c^2d^2 + 4\,Ba^3bcd^3 - Ba^4d^4\right)i^3n\log\left(bx + a\right) + 2\left(12\,Ab^4cd^3i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] 1/24*(6*A*b^4*d^4*i^3*x^4 - 6*B*b^4*c^4*i^3*n*log(d*x + c) + 6*(4*B*a*b^3*c
^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3*b*c*d^3 - B*a^4*d^4)*i^3*n*log(b*x + a
) + 2*(12*A*b^4*c*d^3*i^3 - (B*b^4*c*d^3 - B*a*b^3*d^4)*i^3*n)*x^3 + 3*(12*
A*b^4*c^2*d^2*i^3 - (3*B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*i^3
*n)*x^2 + 6*(4*A*b^4*c^3*d*i^3 - (3*B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 4*B*a
^2*b^2*c*d^3 - B*a^3*b*d^4)*i^3*n)*x + 6*(B*b^4*d^4*i^3*x^4 + 4*B*b^4*c*d^3
*i^3*x^3 + 6*B*b^4*c^2*d^2*i^3*x^2 + 4*B*b^4*c^3*d*i^3*x)*log(e) + 6*(B*b^4
*d^4*i^3*n*x^4 + 4*B*b^4*c*d^3*i^3*n*x^3 + 6*B*b^4*c^2*d^2*i^3*n*x^2 + 4*B*
b^4*c^3*d*i^3*n*x)*log((b*x + a)/(d*x + c)))/(b^4*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.36517, size = 680, normalized size = 4.36

$$-\frac{1}{4}\left(Ad^3i + Bd^3i\right)x^4 + \frac{\left(Bbcd^2in - Bad^3in - 12\,Abcd^2i - 12\,Bbcd^2i\right)x^3}{12\,b} - \frac{1}{4}\left(Bd^3inx^4 + 4\,Bcd^2inx^3 + 6\,Bc^2dinx^2 + 4\,Bc^3in\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] -1/4*(A*d^3*i + B*d^3*i)*x^4 + 1/12*(B*b*c*d^2*i*n - B*a*d^3*i*n - 12*A*b*c
*d^2*i - 12*B*b*c*d^2*i)*x^3/b - 1/4*(B*d^3*i*n*x^4 + 4*B*c*d^2*i*n*x^3 + 6
```

```
*B*c^2*d*i*n*x^2 + 4*B*c^3*i*n*x)*log((b*x + a)/(d*x + c)) + 1/8*(3*B*b^2*c
^2*d*i*n - 4*B*a*b*c*d^2*i*n + B*a^2*d^3*i*n - 12*A*b^2*c^2*d*i - 12*B*b^2*
c^2*d*i)*x^2/b^2 + 1/4*(3*B*b^3*c^3*i*n - 6*B*a*b^2*c^2*d*i*n + 4*B*a^2*b*c
*d^2*i*n - B*a^3*d^3*i*n - 4*A*b^3*c^3*i - 4*B*b^3*c^3*i)*x/b^3 + 1/8*(B*b^
4*c^4*i*n - 4*B*a*b^3*c^3*d*i*n + 6*B*a^2*b^2*c^2*d^2*i*n - 4*B*a^3*b*c*d^3
*i*n + B*a^4*d^4*i*n)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^4*d) - 1/8
*(B*b^5*c^5*i*n + 3*B*a*b^4*c^4*d*i*n - 10*B*a^2*b^3*c^3*d^2*i*n + 10*B*a^3
*b^2*c^2*d^3*i*n - 5*B*a^4*b*c*d^4*i*n + B*a^5*d^5*i*n)*log(abs((2*b*d*x +
b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/(b^4
*d*abs(-b*c + a*d))
```

3.131 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx$

Optimal. Leaf size=373

$$\frac{Bi^3n(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g}+\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g}+\frac{di^3(a+bx)(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{b^4g}$$

```
[Out] (-5*B*d*(b*c - a*d)^2*i^3*n*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*n*(c + d*x)^2
)/(6*b^2*g) + (d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(b^4*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(3*b*g) - (5*B*(b*c - a*d)^3*i^3*n*Log[(a + b*x)/(c + d*x)])/(6*b^4
*g) - (11*B*(b*c - a*d)^3*i^3*n*Log[c + d*x])/(6*b^4*g) - ((b*c - a*d)^3*i^
3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x)
)])/(b^4*g) + (B*(b*c - a*d)^3*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))
])/(b^4*g)
```

Rubi [A] time = 0.600166, antiderivative size = 455, normalized size of antiderivative = 1.22, number of steps used = 22, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2524, 2418, 2390, 12, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^3n(bc-ad)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g}+\frac{i^3(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g}+\frac{i^3(bc-ad)^3\log(ag+bgx)\left(B\log\right.}{b^4g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x),
x]
```

```
[Out] (A*d*(b*c - a*d)^2*i^3*x)/(b^3*g) - (5*B*d*(b*c - a*d)^2*i^3*n*x)/(6*b^3*g)
 - (B*(b*c - a*d)*i^3*n*(c + d*x)^2)/(6*b^2*g) - (5*B*(b*c - a*d)^3*i^3*n*L
og[a + b*x])/(6*b^4*g) - (B*(b*c - a*d)^3*i^3*n*Log[g*(a + b*x)]^2)/(2*b^4*
g) + (B*d*(b*c - a*d)^2*i^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*
g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*g)
 - (B*(b*c - a*d)^3*i^3*n*Log[c + d*x])/(b^4*g) + ((b*c - a*d)^3*i^3*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])*Log[a*g + b*g*x])/(b^4*g) + (B*(b*c - a*d)
^3*i^3*n*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b^4*g) + (B*(b*c
 - a*d)^3*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
```

```
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(131c+131dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ag+bgx}\,dx = \int \left(\frac{2248091d(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g} + \frac{17161d(bc-ad)(131\cdots}{\cdots}\right.$$

$$= \frac{\left(2248091(bc-ad)^3\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ag+bgx}\,dx}{b^3} + \frac{(131d)\int(131c+131dx)^2\left(\cdots\right.}{bg\cdots}$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} + \frac{2248091(bc-ad)(c+dx)^2\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.\right.}{2b^2g}$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} + \frac{2248091Bd(bc-ad)^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g}\cdots$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} + \frac{2248091Bd(bc-ad)^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g}\cdots$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} - \frac{11240455Bd(bc-ad)^2nx}{6b^3g} - \frac{2248091B(bc-a\cdots}{6b^2g\cdots}$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} - \frac{11240455Bd(bc-ad)^2nx}{6b^3g} - \frac{2248091B(bc-a\cdots}{6b^2g\cdots}$$

$$= \frac{2248091Ad(bc-ad)^2x}{b^3g} - \frac{11240455Bd(bc-ad)^2nx}{6b^3g} - \frac{2248091B(bc-a\cdots}{6b^2g\cdots}$$

Mathematica [A] time = 0.272942, size = 368, normalized size = 0.99

$$\frac{i^3\left(-3Bn(bc-ad)^3\left(\log(g(a+bx))\left(\log(g(a+bx))-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+3b^2(c+dx)^2(bc-ad)\left(B\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x),x]
```

```
[Out] (i^3*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)*Lo
g[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b
*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*x)/
(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*(b
*c - a*d)^3*Log[g*(a + b*x)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(
b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[g*(a + b*x)]*(Log[g*
(a + b*x)] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)])))/(6*b^4*g)
```

Maple [F] time = 0.678, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

Maxima [B] time = 2.64474, size = 1262, normalized size = 3.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="maxima")
```

```
[Out] 3*A*c^2*d*i^3*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/6*A*d^3*i^3*(6*a^3*log
(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) + 3/2*A*c*d^
2*i^3*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A*c^3*i^3*lo
g(b*g*x + a*g)/(b*g) - 1/6*(11*b^2*c^3*i^3*n - 15*a*b*c^2*d*i^3*n + 6*a^2*c
*d^2*i^3*n)*B*log(d*x + c)/(b^3*g) + (b^3*c^3*i^3*n - 3*a*b^2*c^2*d*i^3*n +
 3*a^2*b*c*d^2*i^3*n - a^3*d^3*i^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
- a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g) + 1/6*(2*B*b^3*d
^3*i^3*x^3*log(e) - ((i^3*n - 9*i^3*log(e))*b^3*c*d^2 - (i^3*n - 3*i^3*log(
e))*a*b^2*d^3)*B*x^2 - 3*(b^3*c^3*i^3*n - 3*a*b^2*c^2*d*i^3*n + 3*a^2*b*c*d
^2*i^3*n - a^3*d^3*i^3*n)*B*log(b*x + a)^2 - ((7*i^3*n - 18*i^3*log(e))*b^3
*c^2*d - 6*(2*i^3*n - 3*i^3*log(e))*a*b^2*c*d^2 + (5*i^3*n - 6*i^3*log(e))*
a^2*b*d^3)*B*x + (6*b^3*c^3*i^3*log(e) + 18*(i^3*n - i^3*log(e))*a*b^2*c^2*
d - 9*(3*i^3*n - 2*i^3*log(e))*a^2*b*c*d^2 + (11*i^3*n - 6*i^3*log(e))*a^3*
d^3)*B*log(b*x + a) + (2*B*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^2*i^3 - a*b^2*d^3
*i^3)*B*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2*b*d^3*i^3)*B*x +
 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*i^3)*B*lo
g(b*x + a))*log((b*x + a)^n) - (2*B*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^2*i^3 -
a*b^2*d^3*i^3)*B*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2*b*d^3*i
^3)*B*x + 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*
i^3)*B*log(b*x + a))*log((d*x + c)^n))/(b^4*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{Ad^{3}i^{3}x^{3}+3\,Acd^{2}i^{3}x^{2}+3\,Ac^{2}di^{3}x+Ac^{3}i^{3}+\left(Bd^{3}i^{3}x^{3}+3\,Bcd^{2}i^{3}x^{2}+3\,Bc^{2}di^{3}x+Bc^{3}i^{3}\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log(e*((
b*x + a)/(d*x + c))^n))/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^{3}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g), x)
```

3.132 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=390

$$\frac{3Bdi^3n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2}+\frac{2d^2i^3(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^2}+\frac{di^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{2b^2g^2}$$

```
[Out] -(B*d^2*(b*c - a*d)*i^3*n*x)/(2*b^3*g^2) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)
)/(b^3*g^2*(a + b*x)) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^2) - (B*d*(b*c - a*d)^2*i^3*n*Lo
g[(a + b*x)/(c + d*x)])/(2*b^4*g^2) - (5*B*d*(b*c - a*d)^2*i^3*n*Log[c + d*
x])/(2*b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (3*B*d*(b*c - a*d)^2
*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)
```

Rubi [A] time = 0.6914, antiderivative size = 543, normalized size of antiderivative = 1.39, number of steps used = 21, number of rules used = 14, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.326, Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bdi^3n(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g^2}-\frac{a^2Bd^3i^3n\log(a+bx)}{2b^4g^2}+\frac{d^3i^3x^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^2g^2}+\frac{3di^3(bc-ad)^2\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
2,x]
```

```
[Out] (A*d^2*(3*b*c - 2*a*d)*i^3*x)/(b^3*g^2) - (B*d^2*(b*c - a*d)*i^3*n*x)/(2*b^
3*g^2) - (B*(b*c - a*d)^3*i^3*n)/(b^4*g^2*(a + b*x)) - (a^2*B*d^3*i^3*n*Log
[a + b*x])/(2*b^4*g^2) - (B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x])/(b^4*g^2) -
 (3*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]^2)/(2*b^4*g^2) + (B*d^2*(3*b*c - 2
*a*d)*i^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g^2) + (d^3*i^3*x^
2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^2) - ((b*c - a*d)^3*i^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2*(a + b*x)) + (3*d*(b*c - a
*d)^2*i^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) +
(B*c^2*d*i^3*n*Log[c + d*x])/(2*b^2*g^2) - (B*d*(3*b*c - 2*a*d)*(b*c - a*d)
*i^3*n*Log[c + d*x])/(b^4*g^2) + (B*d*(b*c - a*d)^2*i^3*n*Log[c + d*x])/(b^
4*g^2) + (3*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(b^4*g^2) + (3*B*d*(b*c - a*d)^2*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(b^4*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(132c+132dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^2}\,dx = \int \left(\frac{2299968d^2(3bc-2ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^2} + \frac{2299968d^3x\left(\cdots\right.}{\cdots}\right.$$

$$= \frac{\left(2299968d^3\right)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{b^2g^2} + \frac{\left(2299968d^2(3bc-2\cdots\right.}{\cdots}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2} + \frac{1149984d^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2} - \cdots$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2} + \frac{2299968Bd^2(3bc-2ad)(a+bx)\log\left(e\left(\cdots\right.\right.}{b^4g^2}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2} + \frac{2299968Bd^2(3bc-2ad)(a+bx)\log\left(e\left(\cdots\right.\right.}{b^4g^2}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2} - \frac{1149984Bd^2(bc-ad)nx}{b^3g^2} - \frac{2299968B(b\cdots}{b^4g^2(a\cdots}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2} - \frac{1149984Bd^2(bc-ad)nx}{b^3g^2} - \frac{2299968B(b\cdots}{b^4g^2(a\cdots}$$

$$= \frac{2299968Ad^2(3bc-2ad)x}{b^3g^2} - \frac{1149984Bd^2(bc-ad)nx}{b^3g^2} - \frac{2299968B(b\cdots}{b^4g^2(a\cdots}$$

Mathematica [A] time = 0.41922, size = 394, normalized size = 1.01

$$i^3\left(-3Bdn(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-a^2Bd^3n\log(a+bx)+b^2d^3x^2\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^2,x]
```

```
[Out] (i^3*(2*A*b*d^2*(3*b*c - 2*a*d)*x - b*B*d^2*(b*c - a*d)*n*x - (2*B*(b*c - a
*d)^3*n)/(a + b*x) - a^2*B*d^3*n*Log[a + b*x] - 2*B*d*(b*c - a*d)^2*n*Log[a
 + b*x] + 2*B*d^2*(3*b*c - 2*a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n]
+ b^2*d^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (2*(b*c - a*d)^3*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 6*d*(b*c - a*d)^2*Log[a +
b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + b^2*B*c^2*d*n*Log[c + d*x] +
2*B*d*(b*c - a*d)^2*n*Log[c + d*x] - 2*B*d*(-(b*c) + a*d)*(-3*b*c + 2*a*d)*
n*Log[c + d*x] - 3*B*d*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[
(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))
/(2*b^4*g^2)
```

Maple [F] time = 0.699, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{(bgx+ag)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

Maxima [B] time = 2.76488, size = 2410, normalized size = 6.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="maxima")
```

```
[Out] -B*c^3*i^3*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2
) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - 3*A*(a^2/(b^4*g^2*x + a*b^3*g^2
) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*c*d^2*i^3 + 1/2*(2*a^3/(b^5*g
^2*x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2
))*A*d^3*i^3 + 3*A*c^2*d*i^3*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2
*g^2)) - B*c^3*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^2*g^2*x + a*b*
g^2) - A*c^3*i^3/(b^2*g^2*x + a*b*g^2) - 1/2*(5*b^3*c^3*d*i^3*n - 3*a*b^2*c
^2*d^2*i^3*n - 2*a^2*b*c*d^3*i^3*n + 2*a^3*d^4*i^3*n)*B*log(d*x + c)/(b^5*c
*g^2 - a*b^4*d*g^2) + 1/2*((b^4*c*d^3*i^3*log(e) - a*b^3*d^4*i^3*log(e))*B*
x^3 - ((i^3*n - 6*i^3*log(e))*b^4*c^2*d^2 - (2*i^3*n - 9*i^3*log(e))*a*b^3*
```

```
c*d^3 + (i^3*n - 3*i^3*log(e))*a^2*b^2*d^4)*B*x^2 - ((i^3*n - 6*i^3*log(e))
*a*b^3*c^2*d^2 - 2*(i^3*n - 5*i^3*log(e))*a^2*b^2*c*d^3 + (i^3*n - 4*i^3*lo
g(e))*a^3*b*d^4)*B*x - 3*((b^4*c^3*d*i^3*n - 3*a*b^3*c^2*d^2*i^3*n + 3*a^2*
b^2*c*d^3*i^3*n - a^3*b*d^4*i^3*n)*B*x + (a*b^3*c^3*d*i^3*n - 3*a^2*b^2*c^2
*d^2*i^3*n + 3*a^3*b*c*d^3*i^3*n - a^4*d^4*i^3*n)*B)*log(b*x + a)^2 + 2*(3*
(i^3*n + i^3*log(e))*a*b^3*c^3*d - 6*(i^3*n + i^3*log(e))*a^2*b^2*c^2*d^2 +
 4*(i^3*n + i^3*log(e))*a^3*b*c*d^3 - (i^3*n + i^3*log(e))*a^4*d^4)*B + ((6
*b^4*c^3*d*i^3*log(e) + 6*(2*i^3*n - 3*i^3*log(e))*a*b^3*c^2*d^2 - (17*i^3*
n - 18*i^3*log(e))*a^2*b^2*c*d^3 + (7*i^3*n - 6*i^3*log(e))*a^3*b*d^4)*B*x
+ (6*a*b^3*c^3*d*i^3*log(e) + 6*(2*i^3*n - 3*i^3*log(e))*a^2*b^2*c^2*d^2 -
(17*i^3*n - 18*i^3*log(e))*a^3*b*c*d^3 + (7*i^3*n - 6*i^3*log(e))*a^4*d^4)*
B)*log(b*x + a) + ((b^4*c*d^3*i^3 - a*b^3*d^4*i^3)*B*x^3 + 3*(2*b^4*c^2*d^2
*i^3 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B*x^2 + 2*(3*a*b^3*c^2*d^2*i^3
- 5*a^2*b^2*c*d^3*i^3 + 2*a^3*b*d^4*i^3)*B*x + 2*(3*a*b^3*c^3*d*i^3 - 6*a^2
*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B + 6*((b^4*c^3*d*i^3 -
 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B*x + (a*b^3*c^
3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B)*log(b
*x + a))*log((b*x + a)^n) - ((b^4*c*d^3*i^3 - a*b^3*d^4*i^3)*B*x^3 + 3*(2*b
^4*c^2*d^2*i^3 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B*x^2 + 2*(3*a*b^3*c^
2*d^2*i^3 - 5*a^2*b^2*c*d^3*i^3 + 2*a^3*b*d^4*i^3)*B*x + 2*(3*a*b^3*c^3*d*i
^3 - 6*a^2*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B + 6*((b^4*c
^3*d*i^3 - 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B*x +
 (a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3
)*B)*log(b*x + a))*log((d*x + c)^n))/(a*b^5*c*g^2 - a^2*b^4*d*g^2 + (b^6*c*
g^2 - a*b^5*d*g^2)*x) + 3*(b^2*c^2*d*i^3*n - 2*a*b*c*d^2*i^3*n + a^2*d^3*i^
3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d
)/(b*c - a*d)))*B/(b^4*g^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^3i^3x^3 + 3\,Acd^2i^3x^2 + 3\,Ac^2di^3x + Ac^3i^3 + \left(Bd^3i^3x^3 + 3\,Bcd^2i^3x^2 + 3\,Bc^2di^3x + Bc^3i^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log(e*((
b*x + a)/(d*x + c))^n))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g)^2, x)
```

3.133 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=361

$$\frac{3Bd^2i^3n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3}+\frac{d^3i^3(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3}-\frac{3d^2i^3(bc-ad)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\right.}{b^4g^3}$$

```
[Out] (-2*B*d*(b*c - a*d)*i^3*n*(c + d*x))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d)*i
^3*n*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*
(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^3*(a + b*x)^2)
 - (B*d^2*(b*c - a*d)*i^3*n*Log[c + d*x])/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^
3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x)
)])/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))])/(b^4*g^3)
```

Rubi [A] time = 0.708683, antiderivative size = 461, normalized size of antiderivative = 1.28, number of steps used = 21, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bd^2i^3n(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g^3}+\frac{3d^2i^3(bc-ad)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3}-\frac{3di^3(bc-ad)^2\left(B\log\right.}{b^4g^3(a+}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
3,x]
```

```
[Out] (A*d^3*i^3*x)/(b^3*g^3) - (B*(b*c - a*d)^3*i^3*n)/(4*b^4*g^3*(a + b*x)^2) -
 (5*B*d*(b*c - a*d)^2*i^3*n)/(2*b^4*g^3*(a + b*x)) - (5*B*d^2*(b*c - a*d)*i
^3*n*Log[a + b*x])/(2*b^4*g^3) - (3*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x]^2)
/(2*b^4*g^3) + (B*d^3*i^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g^
3) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*g^3*
(a + b*x)^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
))/(b^4*g^3*(a + b*x)) + (3*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*Log[c + d*
x])/(2*b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))
/(b*c - a*d)])/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))])/(b^4*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
```

```
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(133c+133dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^3}\,dx = \int \left(\frac{2352637d^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^3}+\frac{2352637(bc-ad)^3\left(A+\right.}{b^3g^3(a+b}\right.$$

$$=\frac{\left(2352637d^3\right)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{b^3g^3}+\frac{\left(7057911d^2(bc-ad)\right)}{b^3g}$$

$$=\frac{2352637Ad^3x}{b^3g^3}-\frac{2352637(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^4g^3(a+bx)^2}-\frac{7057}{}$$

$$=\frac{2352637Ad^3x}{b^3g^3}+\frac{2352637Bd^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3}-\frac{2352637(bc}{}$$

$$=\frac{2352637Ad^3x}{b^3g^3}+\frac{2352637Bd^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3}-\frac{2352637(bc}{}$$

$$=\frac{2352637Ad^3x}{b^3g^3}-\frac{2352637B(bc-ad)^3n}{4b^4g^3(a+bx)^2}-\frac{11763185Bd(bc-ad)^2n}{2b^4g^3(a+bx)}-$$

$$=\frac{2352637Ad^3x}{b^3g^3}-\frac{2352637B(bc-ad)^3n}{4b^4g^3(a+bx)^2}-\frac{11763185Bd(bc-ad)^2n}{2b^4g^3(a+bx)}-$$

$$=\frac{2352637Ad^3x}{b^3g^3}-\frac{2352637B(bc-ad)^3n}{4b^4g^3(a+bx)^2}-\frac{11763185Bd(bc-ad)^2n}{2b^4g^3(a+bx)}-$$

Mathematica [A] time = 0.455893, size = 331, normalized size = 0.92

$$i^3\left(6Bd^2n(ad-bc)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+12d^2(bc-ad)\log(a+bx)\left(\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^3,x]
```

```
[Out] (i^3*(4*A*b*d^3*x - (B*(b*c - a*d)^3*n)/(a + b*x)^2 - (10*B*d*(b*c - a*d)^2
*n)/(a + b*x) + 10*B*d^2*(-(b*c) + a*d)*n*Log[a + b*x] + 4*B*d^3*(a + b*x)*
Log[e*((a + b*x)/(c + d*x))^n] - (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(a + b*x)^2 - (12*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(a + b*x) + 12*d^2*(b*c - a*d)*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) + 6*B*d^2*(b*c - a*d)*n*Log[c + d*x] + 6*B*d^2*(-(b*c
) + a*d)*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(4*b^4*g^3)
```

Maple [F] time = 0.688, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{(bgx+ag)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

Maxima [B] time = 3.0288, size = 3707, normalized size = 10.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] -3/4*B*c^2*d*i^3*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b
^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3
) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*
d^2)*g^3)) + 1/4*B*c^3*i^3*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^
3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*
log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)
/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A*d^3*i^3*((6*a^2*b*x + 5
*a^3)/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log
(b*x + a)/(b^4*g^3)) + 3/2*A*c*d^2*i^3*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*
a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) - 3/2*(2*b*x + a)*B*
c^2*d*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^3*x^2 + 2*a*b^3*g^3
*x + a^2*b^2*g^3) - 3/2*(2*b*x + a)*A*c^2*d*i^3/(b^4*g^3*x^2 + 2*a*b^3*g^3*
x + a^2*b^2*g^3) - 1/2*B*c^3*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^
3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A*c^3*i^3/(b^3*g^3*x^2 + 2*a*b
^2*g^3*x + a^2*b*g^3) - 1/2*(2*b^3*c^3*d^2*i^3*n + 8*a*b^2*c^2*d^3*i^3*n -
13*a^2*b*c*d^4*i^3*n + 5*a^3*d^5*i^3*n)*B*log(d*x + c)/(b^6*c^2*g^3 - 2*a*b
^5*c*d*g^3 + a^2*b^4*d^2*g^3) + 1/4*(4*(b^5*c^2*d^3*i^3*log(e) - 2*a*b^4*c*
d^4*i^3*log(e) + a^2*b^3*d^5*i^3*log(e))*B*x^3 + 8*(a*b^4*c^2*d^3*i^3*log(e
) - 2*a^2*b^3*c*d^4*i^3*log(e) + a^3*b^2*d^5*i^3*log(e))*B*x^2 + 2*(12*(i^3
*n + i^3*log(e))*a*b^4*c^3*d^2 - (27*i^3*n + 28*i^3*log(e))*a^2*b^3*c^2*d^3
```

```
 + 20*(i^3*n + i^3*log(e))*a^3*b^2*c*d^4 - (5*i^3*n + 4*i^3*log(e))*a^4*b*d
^5)*B*x - 6*((b^5*c^3*d^2*i^3*n - 3*a*b^4*c^2*d^3*i^3*n + 3*a^2*b^3*c*d^4*i
^3*n - a^3*b^2*d^5*i^3*n)*B*x^2 + 2*(a*b^4*c^3*d^2*i^3*n - 3*a^2*b^3*c^2*d^
3*i^3*n + 3*a^3*b^2*c*d^4*i^3*n - a^4*b*d^5*i^3*n)*B*x + (a^2*b^3*c^3*d^2*i
^3*n - 3*a^3*b^2*c^2*d^3*i^3*n + 3*a^4*b*c*d^4*i^3*n - a^5*d^5*i^3*n)*B)*lo
g(b*x + a)^2 + (3*(7*i^3*n + 6*i^3*log(e))*a^2*b^3*c^3*d^2 - (47*i^3*n + 46
*i^3*log(e))*a^3*b^2*c^2*d^3 + (35*i^3*n + 38*i^3*log(e))*a^4*b*c*d^4 - (9*
i^3*n + 10*i^3*log(e))*a^5*d^5)*B + 2*((6*b^5*c^3*d^2*i^3*log(e) + 2*(7*i^3
*n - 9*i^3*log(e))*a*b^4*c^2*d^3 - (19*i^3*n - 18*i^3*log(e))*a^2*b^3*c*d^4
 + (7*i^3*n - 6*i^3*log(e))*a^3*b^2*d^5)*B*x^2 + 2*(6*a*b^4*c^3*d^2*i^3*log
(e) + 2*(7*i^3*n - 9*i^3*log(e))*a^2*b^3*c^2*d^3 - (19*i^3*n - 18*i^3*log(e
))*a^3*b^2*c*d^4 + (7*i^3*n - 6*i^3*log(e))*a^4*b*d^5)*B*x + (6*a^2*b^3*c^3
*d^2*i^3*log(e) + 2*(7*i^3*n - 9*i^3*log(e))*a^3*b^2*c^2*d^3 - (19*i^3*n -
18*i^3*log(e))*a^4*b*c*d^4 + (7*i^3*n - 6*i^3*log(e))*a^5*d^5)*B)*log(b*x +
 a) + 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^4*i^3 + a^2*b^3*d^5*i^3)*B*x^3 +
4*(a*b^4*c^2*d^3*i^3 - 2*a^2*b^3*c*d^4*i^3 + a^3*b^2*d^5*i^3)*B*x^2 + 4*(3*
a*b^4*c^3*d^2*i^3 - 7*a^2*b^3*c^2*d^3*i^3 + 5*a^3*b^2*c*d^4*i^3 - a^4*b*d^5
*i^3)*B*x + (9*a^2*b^3*c^3*d^2*i^3 - 23*a^3*b^2*c^2*d^3*i^3 + 19*a^4*b*c*d^
4*i^3 - 5*a^5*d^5*i^3)*B + 6*((b^5*c^3*d^2*i^3 - 3*a*b^4*c^2*d^3*i^3 + 3*a^
2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 + 2*(a*b^4*c^3*d^2*i^3 - 3*a^2*b^3
*c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x + (a^2*b^3*c^3*d^2*
i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^4*i^3 - a^5*d^5*i^3)*B)*log(b*x +
 a))*log((b*x + a)^n) - 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^4*i^3 + a^2*b^3
*d^5*i^3)*B*x^3 + 4*(a*b^4*c^2*d^3*i^3 - 2*a^2*b^3*c*d^4*i^3 + a^3*b^2*d^5*
i^3)*B*x^2 + 4*(3*a*b^4*c^3*d^2*i^3 - 7*a^2*b^3*c^2*d^3*i^3 + 5*a^3*b^2*c*d
^4*i^3 - a^4*b*d^5*i^3)*B*x + (9*a^2*b^3*c^3*d^2*i^3 - 23*a^3*b^2*c^2*d^3*i
^3 + 19*a^4*b*c*d^4*i^3 - 5*a^5*d^5*i^3)*B + 6*((b^5*c^3*d^2*i^3 - 3*a*b^4*
c^2*d^3*i^3 + 3*a^2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 + 2*(a*b^4*c^3*d
^2*i^3 - 3*a^2*b^3*c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x +
 (a^2*b^3*c^3*d^2*i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^4*i^3 - a^5*d^5
*i^3)*B)*log(b*x + a))*log((d*x + c)^n))/(a^2*b^6*c^2*g^3 - 2*a^3*b^5*c*d*g
^3 + a^4*b^4*d^2*g^3 + (b^8*c^2*g^3 - 2*a*b^7*c*d*g^3 + a^2*b^6*d^2*g^3)*x^
2 + 2*(a*b^7*c^2*g^3 - 2*a^2*b^6*c*d*g^3 + a^3*b^5*d^2*g^3)*x) + 3*(b*c*d^2
*i^3*n - a*d^3*i^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + di
log(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^3i^3x^3 + 3\,Acd^2i^3x^2 + 3\,Ac^2di^3x + Ac^3i^3 + \left(Bd^3i^3x^3 + 3\,Bcd^2i^3x^2 + 3\,Bc^2di^3x + Bc^3i^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^3g^3x^3 + 3\,ab^2g^3x^2 + 3\,a^2bg^3x + a^3g^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log(e*((
b*x + a)/(d*x + c))^n))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^
3*g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g)^3, x)
```

3.134 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=326

$$\frac{Bd^3i^3n\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^4}-\frac{d^2i^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^4(a+bx)}-\frac{d^3i^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^4}-$$

```
[Out] -((B*d^2*i^3*n*(c + d*x))/(b^3*g^4*(a + b*x))) - (B*d*i^3*n*(c + d*x)^2)/(4
*b^2*g^4*(a + b*x)^2) - (B*i^3*n*(c + d*x)^3)/(9*b*g^4*(a + b*x)^3) - (d^2*
i^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^4*(a + b*x)) -
 (d*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^4*(a +
 b*x)^2) - (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*g^
4*(a + b*x)^3) - (d^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b
*(c + d*x))/(d*(a + b*x))])/(b^4*g^4) + (B*d^3*i^3*n*PolyLog[2, (b*(c + d*x
))/(d*(a + b*x))])/(b^4*g^4)
```

Rubi [A] time = 0.794242, antiderivative size = 444, normalized size of antiderivative = 1.36, number of steps used = 22, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^3i^3n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^4g^4}+\frac{d^3i^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^4}-\frac{3d^2i^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^4(a+bx)}-$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x)^
4,x]
```

```
[Out] -(B*(b*c - a*d)^3*i^3*n)/(9*b^4*g^4*(a + b*x)^3) - (7*B*d*(b*c - a*d)^2*i^3
*n)/(12*b^4*g^4*(a + b*x)^2) - (11*B*d^2*(b*c - a*d)*i^3*n)/(6*b^4*g^4*(a +
 b*x)) - (11*B*d^3*i^3*n*Log[a + b*x])/(6*b^4*g^4) - (B*d^3*i^3*n*Log[a + b
*x]^2)/(2*b^4*g^4) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]))/(3*b^4*g^4*(a + b*x)^3) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(2*b^4*g^4*(a + b*x)^2) - (3*d^2*(b*c - a*d)*i^3*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^4*(a + b*x)) + (d^3*i^3*Log[a + b*x
]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^4) + (11*B*d^3*i^3*n*Log[c
 + d*x])/(6*b^4*g^4) + (B*d^3*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(b^4*g^4) + (B*d^3*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b
^4*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(134c+134dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ag+bgx)^4}\,dx = \int\left(\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^4(a+bx)^4} + \frac{7218312d(bc-ad}{b^3g}\right.$$

$$= \frac{\left(2406104d^3\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{b^3g^4} + \frac{\left(7218312d^2(bc-ad)\right)\int \frac{A+B\log}{(a}}{b^3g^4}$$

$$= -\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^4g^4(a+bx)^3} - \frac{3609156d(bc-ad)^2}{b^4g^4(}$$

$$= -\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^4g^4(a+bx)^3} - \frac{3609156d(bc-ad)^2}{b^4g^4(}$$

$$= -\frac{2406104(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b^4g^4(a+bx)^3} - \frac{3609156d(bc-ad)^2}{b^4g^4(}$$

$$= -\frac{2406104B(bc-ad)^3n}{9b^4g^4(a+bx)^3} - \frac{4210682Bd(bc-ad)^2n}{3b^4g^4(a+bx)^2} - \frac{13233572Bd^2(b}{3b^4g^4(a+}$$

$$= -\frac{2406104B(bc-ad)^3n}{9b^4g^4(a+bx)^3} - \frac{4210682Bd(bc-ad)^2n}{3b^4g^4(a+bx)^2} - \frac{13233572Bd^2(b}{3b^4g^4(a+}$$

$$= -\frac{2406104B(bc-ad)^3n}{9b^4g^4(a+bx)^3} - \frac{4210682Bd(bc-ad)^2n}{3b^4g^4(a+bx)^2} - \frac{13233572Bd^2(b}{3b^4g^4(a+}$$

Mathematica [A] time = 0.510102, size = 326, normalized size = 1.

$$i^3\left(-18Bd^3n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+36d^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b
*g*x)^4,x]
```

```
[Out] (i^3*((-4*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (21*B*d*(b*c - a*d)^2*n)/(a + b*
x)^2 + (66*B*d^2*(-(b*c) + a*d)*n)/(a + b*x) - 66*B*d^3*n*Log[a + b*x] - (1
2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^3 - (54*d
*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (108*d
^2*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 36*d^
3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 66*B*d^3*n*Log[c +
d*x] - 18*B*d^3*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(36*b^4*g^4)
```

Maple [F] time = 0.688, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{(bgx+ag)^4}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="maxima")
```

```
[Out] -1/6*B*c*d^2*i^3*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^
2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3
*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 -
2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4
*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b
^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d +
3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^
3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*
g^4)) - 1/18*B*c^3*i^3*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d
^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*
x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2
- 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b
*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2
 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b
^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/12*B*c^2*d*i^3*n*((5*a*b^2*c^2 - 22*a^2*b*c
*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*
d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b
^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*
c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)
 - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3
*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 -
 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) + 1/6*A*d^3*i^3*((18*
a*b^2*x^2 + 27*a^2*b*x + 11*a^3)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5
*g^4*x + a^3*b^4*g^4) + 6*log(b*x + a)/(b^4*g^4)) + 1/6*B*d^3*i^3*(((18*a*b
^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*
log(b*x + a))*log((b*x + a)^n) - (18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b
^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*log(b*x + a))*log((d*x + c)^n))/(b^
7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) + 6*integrate(
1/6*(6*b^4*d*x^4*log(e) + 6*b^4*c*x^3*log(e) - 11*a^3*b*c*n + 11*a^4*d*n -
18*(a*b^3*c*n - a^2*b^2*d*n)*x^2 - 27*(a^2*b^2*c*n - a^3*b*d*n)*x - 6*(a^3*
b*c*n - a^4*d*n + (b^4*c*n - a*b^3*d*n)*x^3 + 3*(a*b^3*c*n - a^2*b^2*d*n)*x
^2 + 3*(a^2*b^2*c*n - a^3*b*d*n)*x)*log(b*x + a))/(b^8*d*g^4*x^5 + a^4*b^4*
c*g^4 + (b^8*c*g^4 + 4*a*b^7*d*g^4)*x^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b^6*d*g^
4)*x^3 + 2*(3*a^2*b^6*c*g^4 + 2*a^3*b^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^4 + a^4
*b^4*d*g^4)*x), x)) - 1/2*(3*b*x + a)*B*c^2*d*i^3*log(e*(b*x/(d*x + c) + a/
(d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^
```

```
4) - (3*b^2*x^2 + 3*a*b*x + a^2)*B*c*d^2*i^3*log(e*(b*x/(d*x + c) + a/(d*x
+ c))^n)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) -
1/2*(3*b*x + a)*A*c^2*d*i^3/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*
x + a^3*b^2*g^4) - (3*b^2*x^2 + 3*a*b*x + a^2)*A*c*d^2*i^3/(b^6*g^4*x^3 + 3
*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/3*B*c^3*i^3*log(e*(b*x/
(d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*
x + a^3*b*g^4) - 1/3*A*c^3*i^3/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g
^4*x + a^3*b*g^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ad^3i^3x^3 + 3\,Acd^2i^3x^2 + 3\,Ac^2di^3x + Ac^3i^3 + \left(Bd^3i^3x^3 + 3\,Bcd^2i^3x^2 + 3\,Bc^2di^3x + Bc^3i^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^4g^4x^4 + 4\,ab^3g^4x^3 + 6\,a^2b^2g^4x^2 + 4\,a^3bg^4x + a^4g^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
 (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log(e*((
b*x + a)/(d*x + c))^n))/(b^4*g^4*x^4 + 4*a*b^3*g^4*x^3 + 6*a^2*b^2*g^4*x^2
+ 4*a^3*b*g^4*x + a^4*g^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g)^4, x)
```

3.135 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=269

$$\frac{Bg^3n(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{6d^2i}+\frac{g^3(a+bx)(bc-ad)^2\left(6B\log\right.}{6}$$

```
[Out] (g^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d*i) - ((b*c -
a*d)*g^3*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d
^2*i) + ((b*c - a*d)^2*g^3*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(6*d^3*i) + ((b*c - a*d)^3*g^3*(6*A + 11*B*n + 6*B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(6*d^4*i) + (B*(b*c -
 a*d)^3*g^3*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i)
```

Rubi [A] time = 0.645896, antiderivative size = 426, normalized size of antiderivative = 1.58, number of steps used = 22, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bg^3n(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^4i}-\frac{g^3(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^2i}-\frac{g^3(bc-ad)^3\log(ci+dix)\left(B\log\left(e\right.\right.}{d^4i}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x),
x]
```

```
[Out] (A*b*(b*c - a*d)^2*g^3*x)/(d^3*i) + (5*b*B*(b*c - a*d)^2*g^3*n*x)/(6*d^3*i)
 - (B*(b*c - a*d)*g^3*n*(a + b*x)^2)/(6*d^2*i) + (B*(b*c - a*d)^2*g^3*(a +
b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i) - ((b*c - a*d)*g^3*(a + b*x)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i) + (g^3*(a + b*x)^3*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d*i) - (11*B*(b*c - a*d)^3*g^3*n*Log[
c + d*x])/(6*d^4*i) - (B*(b*c - a*d)^3*g^3*n*Log[i*(c + d*x)]^2)/(2*d^4*i)
+ (B*(b*c - a*d)^3*g^3*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i + d*i*x]
)/(d^4*i) - ((b*c - a*d)^3*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c
*i + d*i*x])/(d^4*i) + (B*(b*c - a*d)^3*g^3*n*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/(d^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{135c+135dx}dx = \int\left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{135d^3}+\frac{(-bc+ad)^3g^3\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{d^3(135c+135dx)}\right.$$

$$=\frac{(bg)\int(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{135d}-\frac{\left(b(bc-ad)g^2\right)\int(ag+bgx)}{135}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{270d^2}+\frac{g^3(a+b}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{B(bc-ad)^2g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{135d^3}-\frac{(bc-ad)g^3(a+}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{B(bc-ad)^2g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{135d^3}-\frac{(bc-ad)g^3(a+}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{bB(bc-ad)^2g^3nx}{162d^3}-\frac{B(bc-ad)g^3n(a+bx)^2}{810d^2}+\frac{B(bc-a}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{bB(bc-ad)^2g^3nx}{162d^3}-\frac{B(bc-ad)g^3n(a+bx)^2}{810d^2}+\frac{B(bc-a}{}$$

$$=\frac{Ab(bc-ad)^2g^3x}{135d^3}+\frac{bB(bc-ad)^2g^3nx}{162d^3}-\frac{B(bc-ad)g^3n(a+bx)^2}{810d^2}+\frac{B(bc-a}{}$$

Mathematica [A] time = 0.277999, size = 370, normalized size = 1.38

$$\frac{g^3\left(3Bn(bc-ad)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(i(c+dx))\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(i(c+dx))\right)\right)+2d^3(a+bx)^3\left(B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x),x]
```

```
[Out] (g^3*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 - 6*B*(b*c - a*d)^3*n*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x
```

```
- d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n*(b*
d*x + (-(b*c) + a*d)*Log[c + d*x]) - 6*(b*c - a*d)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])*Log[i*(c + d*x)] + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a + b*x
))/(-(b*c) + a*d)] - Log[i*(c + d*x)])*Log[i*(c + d*x)] + 2*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])))/(6*d^4*i)
```

Maple [F] time = 0.685, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

Maxima [B] time = 2.76182, size = 1354, normalized size = 5.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] 3*A*a^2*b*g^3*(x/(d*i) - c*log(d*x + c)/(d^2*i)) - 1/6*A*b^3*g^3*(6*c^3*log
(d*x + c)/(d^4*i) - (2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/(d^3*i)) + 3/2*A*a*b^
2*g^3*(2*c^2*log(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A*a^3*g^3*lo
g(d*i*x + c*i)/(d*i) - (b^3*c^3*g^3*n - 3*a*b^2*c^2*d*g^3*n + 3*a^2*b*c*d^2
*g^3*n - a^3*d^3*g^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) +
dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^4*i) + 1/6*(6*a^3*d^3*g^3*log(e) -
(11*g^3*n + 6*g^3*log(e))*b^3*c^3 + 9*(3*g^3*n + 2*g^3*log(e))*a*b^2*c^2*d
- 18*(g^3*n + g^3*log(e))*a^2*b*c*d^2)*B*log(d*x + c)/(d^4*i) + 1/6*(2*B*b^
3*d^3*g^3*x^3*log(e) - ((g^3*n + 3*g^3*log(e))*b^3*c*d^2 - (g^3*n + 9*g^3*l
og(e))*a*b^2*d^3)*B*x^2 + 6*(b^3*c^3*g^3*n - 3*a*b^2*c^2*d*g^3*n + 3*a^2*b*
c*d^2*g^3*n - a^3*d^3*g^3*n)*B*log(b*x + a)*log(d*x + c) - 3*(b^3*c^3*g^3*n
 - 3*a*b^2*c^2*d*g^3*n + 3*a^2*b*c*d^2*g^3*n - a^3*d^3*g^3*n)*B*log(d*x + c
)^2 + ((5*g^3*n + 6*g^3*log(e))*b^3*c^2*d - 6*(2*g^3*n + 3*g^3*log(e))*a*b^
2*c*d^2 + (7*g^3*n + 18*g^3*log(e))*a^2*b*d^3)*B*x + (6*a*b^2*c^2*d*g^3*n -
 15*a^2*b*c*d^2*g^3*n + 11*a^3*d^3*g^3*n)*B*log(b*x + a) + (2*B*b^3*d^3*g^3
*x^3 - 3*(b^3*c*d^2*g^3 - 3*a*b^2*d^3*g^3)*B*x^2 + 6*(b^3*c^2*d*g^3 - 3*a*b
^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B*x - 6*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 +
3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*B*log(d*x + c))*log((b*x + a)^n) - (2*B*b^
3*d^3*g^3*x^3 - 3*(b^3*c*d^2*g^3 - 3*a*b^2*d^3*g^3)*B*x^2 + 6*(b^3*c^2*d*g^
3 - 3*a*b^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B*x - 6*(b^3*c^3*g^3 - 3*a*b^2*c^2
*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*B*log(d*x + c))*log((d*x + c)^n))
/(d^4*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^3g^3x^3 + 3\,Aab^2g^3x^2 + 3\,Aa^2bg^3x + Aa^3g^3 + \left(Bb^3g^3x^3 + 3\,Bab^2g^3x^2 + 3\,Ba^2bg^3x + Ba^3g^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] integral((A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3 +
 (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log(e*((
b*x + a)/(d*x + c))^n))/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{dix + ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c
*i), x)
```

3.136 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=211

$$-\frac{Bg^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}-\frac{g^2(a+bx)(bc-ad)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+Bn\right)}{2d^2i}-\frac{g^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\ldots}{\ldots}$$

```
[Out] (g^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i) - ((b*c -
a*d)*g^2*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2
*i) - ((b*c - a*d)^2*g^2*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[(b*c - a*d)/(b*(c + d*x))])/(2*d^3*i) - (B*(b*c - a*d)^2*g^2*n*PolyLog
[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i)
```

Rubi [A] time = 0.487975, antiderivative size = 343, normalized size of antiderivative = 1.63, number of steps used = 18, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{Bg^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^3i}+\frac{g^2(bc-ad)^2\log(ci+dix)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i}+\frac{g^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\ldots\right)}{2di}\ldots$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x),
x]
```

```
[Out] -((A*b*(b*c - a*d)*g^2*x)/(d^2*i)) - (b*B*(b*c - a*d)*g^2*n*x)/(2*d^2*i) -
(B*(b*c - a*d)*g^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i) + (g^2
*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i) + (3*B*(b*c -
a*d)^2*g^2*n*Log[c + d*x])/(2*d^3*i) + (B*(b*c - a*d)^2*g^2*n*Log[i*(c + d*
x)]^2)/(2*d^3*i) - (B*(b*c - a*d)^2*g^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c*i + d*i*x])/(d^3*i) + ((b*c - a*d)^2*g^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[c*i + d*i*x])/(d^3*i) - (B*(b*c - a*d)^2*g^2*n*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/(d^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{136c+136dx}\,dx = \int \Bigg(-\frac{b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{136d^2}+\frac{(bc-ad)^2g^2\Big(A+B\log\Big(e\Big(}{d^2(136c+136dx)}$$

$$=\frac{(bg)\int (ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{136d}-\frac{\left(b(bc-ad)g^2\right)\int\Big(A+B\,\mathrm{l}}{136d^2}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}+\frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{272d}+\frac{(bc-ad)^2g^2\Big(}{}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{136d^2}+\frac{g^2(a+bx)^2\Big(}{}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{B(bc-ad)g^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{136d^2}+\frac{g^2(a+bx)^2\Big(}{}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{bB(bc-ad)g^2nx}{272d^2}-\frac{B(bc-ad)g^2(a+bx)\log\Big(e\Big(\frac{a+bx}{c+dx}}{136d^2}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{bB(bc-ad)g^2nx}{272d^2}-\frac{B(bc-ad)g^2(a+bx)\log\Big(e\Big(\frac{a+bx}{c+dx}}{136d^2}$$

$$=-\frac{Ab(bc-ad)g^2x}{136d^2}-\frac{bB(bc-ad)g^2nx}{272d^2}-\frac{B(bc-ad)g^2(a+bx)\log\Big(e\Big(\frac{a+bx}{c+dx}}{136d^2}$$

Mathematica [A] time = 0.175108, size = 266, normalized size = 1.26

$$\frac{g^2\left(-Bn(bc-ad)^2\left(2\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(i(c+dx))\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(i(c+dx))\right)\right)+d^2(a+bx)^2\Big(B\log\Big(e\Big(}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x),x]
```

```
[Out] (g^2*(-2*A*b*d*(b*c - a*d)*x + 2*B*d*(-(b*c) + a*d)*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
+ 2*B*(b*c - a*d)^2*n*Log[c + d*x] - B*(b*c - a*d)*n*(b*d*x + (-(b*c) + a*d
)*Log[c + d*x]) + 2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Lo
g[i*(c + d*x)] - B*(b*c - a*d)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[i*(c + d*x)])*Log[i*(c + d*x)] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
```

```
]))/(2*d^3*i)
```

Maple [F] time = 0.695, size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2}{dix+ci}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

Maxima [B] time = 2.66897, size = 846, normalized size = 4.01

$$2\,Aabg^2\left(\frac{x}{di}-\frac{c\log(dx+c)}{d^2i}\right)+\frac{1}{2}\,Ab^2g^2\left(\frac{2\,c^2\log(dx+c)}{d^3i}+\frac{dx^2-2\,cx}{d^2i}\right)+\frac{Aa^2g^2\log(dix+ci)}{di}+\frac{\left(b^2c^2g^2n-2\,abcdg^2n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] 2*A*a*b*g^2*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + 1/2*A*b^2*g^2*(2*c^2*log(d
*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A*a^2*g^2*log(d*i*x + c*i)/(d*
i) + (b^2*c^2*g^2*n - 2*a*b*c*d*g^2*n + a^2*d^2*g^2*n)*(log(b*x + a)*log((b
*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^3*i)
 + 1/2*(2*a^2*d^2*g^2*log(e) + (3*g^2*n + 2*g^2*log(e))*b^2*c^2 - 4*(g^2*n
+ g^2*log(e))*a*b*c*d)*B*log(d*x + c)/(d^3*i) + 1/2*(B*b^2*d^2*g^2*x^2*log(
e) - 2*(b^2*c^2*g^2*n - 2*a*b*c*d*g^2*n + a^2*d^2*g^2*n)*B*log(b*x + a)*log
(d*x + c) + (b^2*c^2*g^2*n - 2*a*b*c*d*g^2*n + a^2*d^2*g^2*n)*B*log(d*x + c
)^2 - ((g^2*n + 2*g^2*log(e))*b^2*c*d - (g^2*n + 4*g^2*log(e))*a*b*d^2)*B*x
 - (2*a*b*c*d*g^2*n - 3*a^2*d^2*g^2*n)*B*log(b*x + a) + (B*b^2*d^2*g^2*x^2
- 2*(b^2*c*d*g^2 - 2*a*b*d^2*g^2)*B*x + 2*(b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^
2*d^2*g^2)*B*log(d*x + c))*log((b*x + a)^n) - (B*b^2*d^2*g^2*x^2 - 2*(b^2*c
*d*g^2 - 2*a*b*d^2*g^2)*B*x + 2*(b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)
*B*log(d*x + c))*log((d*x + c)^n))/(d^3*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^2g^2x^2+2\,Aabg^2x+Aa^2g^2+\left(Bb^2g^2x^2+2\,Babg^2x+Ba^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{dix+ci},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*
a*b*g^2*x + B*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^n))/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c
*i), x)
```

3.137 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix}\,dx$

Optimal. Leaf size=134

$$\frac{Bgn(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}+\frac{g(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{d^2i}+\frac{g(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{di}$$

```
[Out] (g*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d*i) + ((b*c - a*d)*g
*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))
])/(d^2*i) + (B*(b*c - a*d)*g*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d
^2*i)
```

Rubi [A] time = 0.388567, antiderivative size = 223, normalized size of antiderivative = 1.66, number of steps used = 13, number of rules used = 10, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.244, Rules used = {2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bgn(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2i}-\frac{g(bc-ad)\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i}-\frac{Bgn(bc-ad)\log^2(c+dx)}{2d^2i}-\frac{Bgn(b}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x),x]
```

```
[Out] (A*b*g*x)/(d*i) + (B*g*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d*i) - (B
*(b*c - a*d)*g*n*Log[c + d*x])/(d^2*i) + (B*(b*c - a*d)*g*n*Log[-((d*(a + b
*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*i) - ((b*c - a*d)*g*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[c + d*x])/(d^2*i) - (B*(b*c - a*d)*g*n*Log[c + d*
x]^2)/(2*d^2*i) + (B*(b*c - a*d)*g*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(d^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{137c+137dx}\,dx = \int \left(\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{137d} + \frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{137d(c+dx)}\right)dx$$

$$= \frac{(bg)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{137d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{137d}$$

$$= \frac{Abgx}{137d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)}{137d^2} + \frac{(bBg)\int \log\left(e\left(\frac{a+b}{c+d}\right.\right.}{137d}$$

$$= \frac{Abgx}{137d} + \frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log}{137d^2}$$

$$= \frac{Abgx}{137d} + \frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d} - \frac{B(bc-ad)gn\log(c+dx)}{137d^2} - \frac{(bc-ad)g}{}$$

$$= \frac{Abgx}{137d} + \frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d} - \frac{B(bc-ad)gn\log(c+dx)}{137d^2} + \frac{B(bc-ad)}{}$$

$$= \frac{Abgx}{137d} + \frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d} - \frac{B(bc-ad)gn\log(c+dx)}{137d^2} + \frac{B(bc-ad)}{}$$

$$= \frac{Abgx}{137d} + \frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{137d} - \frac{B(bc-ad)gn\log(c+dx)}{137d^2} + \frac{B(bc-ad)}{}$$

Mathematica [A] time = 0.118595, size = 170, normalized size = 1.27

$$\frac{g\left(Bn(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2(bc-ad)\log(c+dx)\left(B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.\right.}{2d^2i}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i
*x),x]
```

```
[Out] (g*(2*A*b*d*x + 2*B*d*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*(b*c -
 a*d)*n*Log[c + d*x] - 2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[c + d*x] + B*(b*c - a*d)*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^2
*i)
```

Maple [F] time = 0.645, size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{dix+ci}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

Maxima [B] time = 2.68274, size = 413, normalized size = 3.08

$$Abg\left(\frac{x}{di} - \frac{c\log(dx+c)}{d^2i}\right) + \frac{Aag\log(dix+ci)}{di} - \frac{(bcgn - adgn)\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right) + \mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{d^2i} + \frac{(a\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] A*b*g*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + A*a*g*log(d*i*x + c*i)/(d*i) - (
b*c*g*n - a*d*g*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog
(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^2*i) + (a*d*g*log(e) - (g*n + g*log(e))*
b*c)*B*log(d*x + c)/(d^2*i) + 1/2*(2*B*a*d*g*n*log(b*x + a) + 2*B*b*d*g*x*l
og(e) + 2*(b*c*g*n - a*d*g*n)*B*log(b*x + a)*log(d*x + c) - (b*c*g*n - a*d*
g*n)*B*log(d*x + c)^2 + 2*(B*b*d*g*x - (b*c*g - a*d*g)*B*log(d*x + c))*log(
(b*x + a)^n) - 2*(B*b*d*g*x - (b*c*g - a*d*g)*B*log(d*x + c))*log((d*x + c)
^n))/(d^2*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{Abgx + Aag + (Bbgx + Bag)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{dix+ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] integral((A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log(e*((b*x + a)/(d*x + c))^n
))/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i
), x)
```

3.138 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ci+dix}\,dx$

Optimal. Leaf size=80

$$-\frac{Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{di}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di}$$

```
[Out] -(((A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(
d*i)) - (B*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d*i)
```

Rubi [A] time = 0.20157, antiderivative size = 128, normalized size of antiderivative = 1.6, number of steps used = 9, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {2524, 2418, 2394, 2393, 2391, 2390, 12, 2301}

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di}+\frac{\log(ci+dix)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di}-\frac{Bn\log(ci+dix)\log\left(-\frac{d(a+bx)}{bc-ad}\right)}{di}+\frac{Bn\log^2(i(c+d$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x),x]
```

```
[Out] (B*n*Log[i*(c + d*x)]^2)/(2*d*i) - (B*n*Log[-((d*(a + b*x))/(b*c - a*d))]*L
og[c*i + d*i*x])/(d*i) + ((A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c*i +
d*i*x])/(d*i) - (B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*i)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{138c+138dx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} - \frac{(Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\log(138c+138dx)}{a+bx}\,dx}{138d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} - \frac{(Bn)\int \left(\frac{b\log(138c+138dx)}{a+bx}-\frac{d\log(138c+138dx)}{c+dx}\right) d}{138d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} + \frac{1}{138}(Bn)\int \frac{\log(138c+138dx)}{c+dx}\,dx - \frac{(bBn)\int}{}$$

$$= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(138c+138dx)}{138d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} + (B$$

$$= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(138c+138dx)}{138d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(138c+138dx)}{138d} + \frac{(B}{}$$

$$= \frac{Bn\log^2(138(c+dx))}{276d} - \frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(138c+138dx)}{138d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\text{lo}}{138d}$$

Mathematica [A] time = 0.0322407, size = 101, normalized size = 1.26

$$\frac{\log(i(c+dx))\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-2Bn\log\left(\frac{d(a+bx)}{ad-bc}\right)+2A+Bn\log(i(c+dx))\right)-2Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2di}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x),x]
```

```
[Out] (Log[i*(c + d*x)]*(2*A - 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*B*Log[
e*((a + b*x)/(c + d*x))^n] + B*n*Log[i*(c + d*x)]) - 2*B*n*PolyLog[2, (b*(c
```

```
+ d*x))/(b*c - a*d)])/(2*d*i)
```

Maple [F] time = 0.611, size = 0, normalized size = 0.

$$\int \frac{1}{dix+ci}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}B\left(\frac{2\,n\log\left(bx+a\right)\log\left(dx+c\right)-n\log\left(dx+c\right)^{2}-2\,\log\left(dx+c\right)\log\left(\left(bx+a\right)^{n}\right)+2\,\log\left(dx+c\right)\log\left(\left(dx+c\right)^{n}\right)}{di}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="maxima
")
```

```
[Out] -1/2*B*((2*n*log(b*x + a)*log(d*x + c) - n*log(d*x + c)^2 - 2*log(d*x + c)*
log((b*x + a)^n) + 2*log(d*x + c)*log((d*x + c)^n))/(d*i) - 2*integrate((n*
log(b*x + a) + log(e))/(d*i*x + c*i), x)) + A*log(d*i*x + c*i)/(d*i)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{dix+ci},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="fricas
")
```

```
[Out] integral((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i), x)
```

3.139 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=50

$$\frac{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2Bgin(bc-ad)}$$

```
[Out] (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*B*(b*c - a*d)*g*i*n)
```

Rubi [C] time = 0.556831, antiderivative size = 316, normalized size of antiderivative = 6.32, number of steps used = 18, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.186, Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bn\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{gi(bc-ad)}+\frac{Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{gi(bc-ad)}+\frac{\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{gi(bc-ad)}-\frac{\log(c+dx)\left(B\log\left(e\left(\frac{a\text{-}}{c\text{-}}\right.\right.\right.}{gi(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*x)),x]
```

```
[Out] -(B*n*Log[a + b*x]^2)/(2*(b*c - a*d)*g*i) + (Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/((b*c - a*d)*g*i) + (B*n*Log[-((d*(a + b*x))/(b*c -
a*d))]*Log[c + d*x])/((b*c - a*d)*g*i) - ((A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x])/((b*c - a*d)*g*i) - (B*n*Log[c + d*x]^2)/(2*(b*c - a*d)
*g*i) + (B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i)
 + (B*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)*g*i) + (B*n*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
```

```
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(139c+139dx)(ag+bgx)}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g(c+dx)}\right)dx$$

$$= \frac{b\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{139(bc-ad)g} - \frac{d\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{139(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)}{139(bc-ad)g} - \frac{(Bn)\int \cdots}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)}{139(bc-ad)g} - \frac{(Bn)\int \left(\cdots\right.}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)}{139(bc-ad)g} - \frac{(bBn)\int \cdots}{139(b\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} + \frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{139(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\cdots\right.\right.\right.}{139\cdots}$$

$$= -\frac{Bn\log^2(a+bx)}{278(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} + \frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+\cdots}{139(bc-ad)g}$$

$$= -\frac{Bn\log^2(a+bx)}{278(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc-ad)g} + \frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+\cdots}{139(bc-ad)g}$$

Mathematica [C] time = 0.103702, size = 219, normalized size = 4.38

$$2Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+2A\log(a+bx)+2B\log(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-2B\log(c+d$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*
x)),x]
```

```
[Out] (2*A*Log[a + b*x] - B*n*Log[a + b*x]^2 + 2*B*Log[a + b*x]*Log[e*((a + b*x)/
(c + d*x))^n] - 2*A*Log[c + d*x] + 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*
Log[c + d*x] - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x] - B*n*Log[c
+ d*x]^2 + 2*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 2*B*n*PolyLo
g[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*B*n*PolyLog[2, (b*(c + d*x))/(b*c -
a*d)])/(2*(b*c - a*d)*g*i)
```

Maple [F] time = 0.758, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)(dix+ci)}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

Maxima [B] time = 1.16397, size = 236, normalized size = 4.72

$$B\left(\frac{\log(bx+a)}{(bc-ad)gi}-\frac{\log(dx+c)}{(bc-ad)gi}\right)\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)-\frac{\left(\log(bx+a)^2-2\log(bx+a)\log(dx+c)+\log(dx+c)\right.}{2\left(bcgi-adgi\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algor
ithm="maxima")
```

```
[Out] B*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x + c)/((b*c - a*d)*g*i))*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n) - 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(
d*x + c) + log(d*x + c)^2)*B*n/(b*c*g*i - a*d*g*i) + A*(log(b*x + a)/((b*c
- a*d)*g*i) - log(d*x + c)/((b*c - a*d)*g*i))
```

Fricas [A] time = 0.513175, size = 169, normalized size = 3.38

$$\frac{Bn\log\left(\frac{bx+a}{dx+c}\right)^2+2B\log(e)\log\left(\frac{bx+a}{dx+c}\right)+2A\log\left(\frac{bx+a}{dx+c}\right)}{2(bc-ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algor
ithm="fricas")
```

```
[Out] 1/2*(B*n*log((b*x + a)/(d*x + c))^2 + 2*B*log(e)*log((b*x + a)/(d*x + c)) +
 2*A*log((b*x + a)/(d*x + c)))/((b*c - a*d)*g*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.30973, size = 143, normalized size = 2.86

$$-\frac{Bin\log\left(\frac{bx+a}{dx+c}\right)^2}{2\left(bcg-adg\right)}-\frac{(Ai+Bi)\log\left(\left|\frac{2\,bdx+bc+ad-|-bc+ad|}{2\,bdx+bc+ad+|-bc+ad|}\right|\right)}{g|-bc+ad|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] -1/2*B*i*n*log((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - (A*i + B*i)*log(abs
((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c +
a*d))))/(g*abs(-b*c + a*d))
```

3.140 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=181

$$-\frac{d\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i(bc-ad)^2}-\frac{b(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i(a+bx)(bc-ad)^2}-\frac{bBn(c+dx)}{g^2i(a+bx)(bc-ad)^2}+\frac{Bdn\log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2i(bc-ad)^2}$$

```
[Out] -((b*B*n*(c + d*x))/((b*c - a*d)^2*g^2*i*(a + b*x))) - (b*(c + d*x)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (d*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^2*
g^2*i) + (B*d*n*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^2*g^2*i)
```

Rubi [C] time = 0.688696, antiderivative size = 455, normalized size of antiderivative = 2.51, number of steps used = 22, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{BdnPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^2i(bc-ad)^2}-\frac{BdnPolyLog\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^2i(bc-ad)^2}-\frac{d\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i(bc-ad)^2}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^2i(a+bx)(bc-a}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)),
x]
```

```
[Out] -((B*n)/((b*c - a*d)*g^2*i*(a + b*x))) - (B*d*n*Log[a + b*x])/((b*c - a*d)^
2*g^2*i) + (B*d*n*Log[a + b*x]^2)/(2*(b*c - a*d)^2*g^2*i) - (A + B*Log[e*((
a + b*x)/(c + d*x))^n])/((b*c - a*d)*g^2*i*(a + b*x)) - (d*Log[a + b*x]*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^2*i) + (B*d*n*Log[c +
 d*x])/((b*c - a*d)^2*g^2*i) - (B*d*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log
[c + d*x])/((b*c - a*d)^2*g^2*i) + (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (B*d*n*Log[c + d*x]^2)/(2*(b*c - a*
d)^2*g^2*i) - (B*d*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a
*d)^2*g^2*i) - (B*d*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d
)^2*g^2*i) - (B*d*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g
^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(140c+140dx)(ag+bgx)^2}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{140(bc-ad)^2g^2(c}\right.$$

$$= -\frac{(bd)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{140(bc-ad)^2g^2} + \frac{d^2\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{140(bc-ad)^2g^2} + \frac{b\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}dx}{140(bc-ad)g^2}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2} + \frac{d\left(A+B\log\right.}{14}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2} + \frac{d\left(A+B\log\right.}{14}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc-ad)^2g^2} + \frac{d\left(A+B\log\right.}{14}$$

$$= -\frac{Bn}{140(bc-ad)g^2(a+bx)} - \frac{Bdn\log(a+bx)}{140(bc-ad)^2g^2} - \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc-ad)g^2(a+bx)} - \frac{d\log(a+}{}$$

$$= -\frac{Bn}{140(bc-ad)g^2(a+bx)} - \frac{Bdn\log(a+bx)}{140(bc-ad)^2g^2} + \frac{Bdn\log^2(a+bx)}{280(bc-ad)^2g^2} - \frac{A+B\log\left(e\right.}{140(bc-ad)g^2}$$

$$= -\frac{Bn}{140(bc-ad)g^2(a+bx)} - \frac{Bdn\log(a+bx)}{140(bc-ad)^2g^2} + \frac{Bdn\log^2(a+bx)}{280(bc-ad)^2g^2} - \frac{A+B\log\left(e\right.}{140(bc-ad)g^2}$$

Mathematica [C] time = 0.283996, size = 304, normalized size = 1.68

$$-\frac{-Bdn(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bdn(a+bx)\left(2\text{PolyLog}\left(2,\frac{b(c}{bc}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*
i*x)),x]
```

```
[Out] -(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d*(a + b*x)*Log[
a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(a + b*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*B*n*(b*c - a*d + d*(a + b*x)*L
og[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*n*(a + b*x)*(Log[a + b*x]*(Lo
g[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)]) + B*d*n*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
 Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*
(b*c - a*d)^2*g^2*i*(a + b*x))
```

Maple [F] time = 0.75, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^2(dix+ci)}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

Maxima [B] time = 1.32297, size = 576, normalized size = 3.18

$$-B\left(\frac{1}{\left(b^2c-abd\right)g^2ix+\left(abc-a^2d\right)g^2i}+\frac{d\log\left(bx+a\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)g^2i}-\frac{d\log\left(dx+c\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)g^2i}\right)\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] -B*(1/((b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((
b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*
d + a^2*d^2)*g^2*i))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*((b*d*x +
 a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*
d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))*log(
d*x + c))*B*n/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*d^2*g^2*i + (b^3*c
^2*g^2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*i)*x) - A*(1/((b^2*c - a*b*d)*
g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a
^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i))
```

Fricas [A] time = 0.504065, size = 446, normalized size = 2.46

$$-\frac{2\,Abc-2\,Aad+\left(Bbdnx+Badn\right)\log\left(\frac{bx+a}{dx+c}\right)^2+2\left(Bbc-Bad\right)n+2\left(Bbc-Bad+\left(Bbdx+Bad\right)\log\left(\frac{bx+a}{dx+c}\right)\right)\log\left(e\right)+2\,(\ldots}{2\left(\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)g^2ix+\left(ab^2c^2-2\,a^2bcd+a^3d^2\right)g^2i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] -1/2*(2*A*b*c - 2*A*a*d + (B*b*d*n*x + B*a*d*n)*log((b*x + a)/(d*x + c))^2
 + 2*(B*b*c - B*a*d)*n + 2*(B*b*c - B*a*d + (B*b*d*x + B*a*d)*log((b*x + a)/
(d*x + c)))*log(e) + 2*(B*b*c*n + A*a*d + (B*b*d*n + A*b*d)*x)*log((b*x + a
)/(d*x + c)))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*i*x + (a*b^2*c^2 - 2
*a^2*b*c*d + a^3*d^2)*g^2*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{\left(bgx+ag\right)^2(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^2*(d*i*x +
c*i)), x)
```

3.141 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=266

$$-\frac{b^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3}+\frac{d^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(bc-ad)^3}+\frac{2bd(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(a+bx)(bc-ad)^3}-\cdots$$

```
[Out] -(B*n*(c + d*x)^2*(b - (4*d*(a + b*x))/(c + d*x))^2)/(4*(b*c - a*d)^3*g^3*i
*(a + b*x)^2) + (2*b*d*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((
b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (d^2*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^3*g^3*i) - (B*d
^2*n*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^3*g^3*i)
```

Rubi [C] time = 0.834219, antiderivative size = 557, normalized size of antiderivative = 2.09, number of steps used = 26, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^2n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^3i(bc-ad)^3}+\frac{Bd^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^3i(bc-ad)^3}+\frac{d^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(bc-ad)^3}-\frac{d^2\log(c+dx)\left(B\log\cdots\right.}{g^3i(bc\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)),
x]
```

```
[Out] -(B*n)/(4*(b*c - a*d)*g^3*i*(a + b*x)^2) + (3*B*d*n)/(2*(b*c - a*d)^2*g^3*i
*(a + b*x)) + (3*B*d^2*n*Log[a + b*x])/(2*(b*c - a*d)^3*g^3*i) - (B*d^2*n*L
og[a + b*x]^2)/(2*(b*c - a*d)^3*g^3*i) - (A + B*Log[e*((a + b*x)/(c + d*x))
^n])/(2*(b*c - a*d)*g^3*i*(a + b*x)^2) + (d*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/((b*c - a*d)^2*g^3*i*(a + b*x)) + (d^2*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^3*i) - (3*B*d^2*n*Log[c + d*x])/
(2*(b*c - a*d)^3*g^3*i) + (B*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/((b*c - a*d)^3*g^3*i) - (d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[c + d*x])/((b*c - a*d)^3*g^3*i) - (B*d^2*n*Log[c + d*x]^2)/(2*(b*c - a
*d)^3*g^3*i) + (B*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c
- a*d)^3*g^3*i) + (B*d^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c
- a*d)^3*g^3*i) + (B*d^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a
*d)^3*g^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(141c+141dx)(ag+bgx)^3}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)g^3(a+bx)^3} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)^2} + \frac{bd^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{141(bc-ad)^3g^3(a+\right.$$

$$= \frac{\left(bd^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{141(bc-ad)^3g^3} - \frac{d^3\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{141(bc-ad)^3g^3} - \frac{(bd)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}dx}{141(bc-ad)^2g^3} + \cdots$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\cdots\right.\right.}{141(bc-ad)^3g^3}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\cdots\right.\right.}{141(bc-ad)^3g^3}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B\log\left(\cdots\right.\right.}{141(bc-ad)^3g^3}$$

$$= -\frac{Bn}{564(bc-ad)g^3(a+bx)^2} + \frac{Bdn}{94(bc-ad)^2g^3(a+bx)} + \frac{Bd^2n\log(a+bx)}{94(bc-ad)^3g^3} - \frac{A+B\log\cdots}{282(bc-\cdots}$$

$$= -\frac{Bn}{564(bc-ad)g^3(a+bx)^2} + \frac{Bdn}{94(bc-ad)^2g^3(a+bx)} + \frac{Bd^2n\log(a+bx)}{94(bc-ad)^3g^3} - \frac{Bd^2n\log^2\cdots}{282(bc-\cdots}$$

$$= -\frac{Bn}{564(bc-ad)g^3(a+bx)^2} + \frac{Bdn}{94(bc-ad)^2g^3(a+bx)} + \frac{Bd^2n\log(a+bx)}{94(bc-ad)^3g^3} - \frac{Bd^2n\log^2\cdots}{282(bc-\cdots}$$

Mathematica [C] time = 0.380885, size = 434, normalized size = 1.63

$$-2Bd^2n(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2Bd^2n(a+bx)^2\left(2\text{PolyLog}\left(2,\cdots\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*
i*x)),x]
```

```
[Out] (-2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d*(b*c - a*d)*
(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*x)^2*Log[a
+ b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b*x)^2*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 4*B*d*n*(a + b*x)*(b*c - a*d +
 d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2
+ 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a
+ b*x)^2*Log[c + d*x]) - 2*B*d^2*n*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) + 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c
- a*d)^3*g^3*i*(a + b*x)^2)
```

Maple [F] time = 0.764, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^3 (dix+ci)} \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

Maxima [B] time = 1.42947, size = 1199, normalized size = 4.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] 1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i
*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2
*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d
 + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) - 1/4*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x
 + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*
x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2
)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^
2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))*B*n/(a^2*b^3*c^3*g^3
*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3
*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x
^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a
^4*b*d^3*g^3*i)*x) + 1/2*A*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d
 + a^2*b^2*d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i
*x + (a^2*b^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c
)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))
```

Fricas [A] time = 0.556775, size = 1023, normalized size = 3.85

$$-\frac{2\,Ab^2c^2 - 8\,Aabcd + 6\,Aa^2d^2 - 2\left(Bb^2d^2nx^2 + 2\,Babd^2nx + Ba^2d^2n\right)\log\left(\frac{bx+a}{dx+c}\right)^2 + \left(Bb^2c^2 - 8\,Babcd + 7\,Ba^2d^2\right)n - \cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] -1/4*(2*A*b^2*c^2 - 8*A*a*b*c*d + 6*A*a^2*d^2 - 2*(B*b^2*d^2*n*x^2 + 2*B*a*
b*d^2*n*x + B*a^2*d^2*n)*log((b*x + a)/(d*x + c))^2 + (B*b^2*c^2 - 8*B*a*b*
c*d + 7*B*a^2*d^2)*n - 2*(2*A*b^2*c*d - 2*A*a*b*d^2 + 3*(B*b^2*c*d - B*a*b*
```

```
d^2)*n)*x + 2*(B*b^2*c^2 - 4*B*a*b*c*d + 3*B*a^2*d^2 - 2*(B*b^2*c*d - B*a*b
*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*a*b*d^2*x + B*a^2*d^2)*log((b*x + a)/(d*x
+ c)))*log(e) - 2*(2*A*a^2*d^2 + (3*B*b^2*d^2*n + 2*A*b^2*d^2)*x^2 - (B*b^2
*c^2 - 4*B*a*b*c*d)*n + 2*(2*A*a*b*d^2 + (B*b^2*c*d + 2*B*a*b*d^2)*n)*x)*lo
g((b*x + a)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b
^2*d^3)*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*
b*d^3)*g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d^3)*
g^3*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{\left(bgx+ag\right)^3(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^3*(d*i*x +
c*i)), x)
```

3.142 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=389

$$\frac{3b^2d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4i(a+bx)^2(bc-ad)^4}-\frac{b^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4i(a+bx)^3(bc-ad)^4}-\frac{d^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(bc-ad)^4}$$

```
[Out] (-3*b*B*d^2*n*(c + d*x))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B*d*n*(c
+ d*x)^2)/(4*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (b^3*B*n*(c + d*x)^3)/(9*(b
*c - a*d)^4*g^4*i*(a + b*x)^3) - (3*b*d^2*(c + d*x)*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*d*(c + d*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^4*i*(a + b*x)^2) -
(b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^4*g
^4*i*(a + b*x)^3) - (d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*
x)/(c + d*x)])/((b*c - a*d)^4*g^4*i) + (B*d^3*n*Log[(a + b*x)/(c + d*x)]^2)
/(2*(b*c - a*d)^4*g^4*i)
```

Rubi [C] time = 1.07713, antiderivative size = 646, normalized size of antiderivative = 1.66, number of steps used = 30, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{Bd^3n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^4i(bc-ad)^4}-\frac{Bd^3n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^4i(bc-ad)^4}-\frac{d^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(bc-ad)^4}+\frac{d^3\log(c+dx)\left(\cdots\right.}{g^4\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*i*x)),
x]
```

```
[Out] -(B*n)/(9*(b*c - a*d)*g^4*i*(a + b*x)^3) + (5*B*d*n)/(12*(b*c - a*d)^2*g^4*
i*(a + b*x)^2) - (11*B*d^2*n)/(6*(b*c - a*d)^3*g^4*i*(a + b*x)) - (11*B*d^3
*n*Log[a + b*x])/(6*(b*c - a*d)^4*g^4*i) + (B*d^3*n*Log[a + b*x]^2)/(2*(b*c
 - a*d)^4*g^4*i) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])/(3*(b*c - a*d)*g^
4*i*(a + b*x)^3) + (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d
)^2*g^4*i*(a + b*x)^2) - (d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c
 - a*d)^3*g^4*i*(a + b*x)) - (d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/((b*c - a*d)^4*g^4*i) + (11*B*d^3*n*Log[c + d*x])/(6*(b*c - a*d
)^4*g^4*i) - (B*d^3*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c
 - a*d)^4*g^4*i) + (d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x]
)/((b*c - a*d)^4*g^4*i) + (B*d^3*n*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^4*i)
- (B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*
i) - (B*d^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^4*
i) - (B*d^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(142c+142dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2\left(A+B\log\left(e\left(\right.\right.\right.}{142(bc-ad)^3g^4(a}\right.$$

$$= -\frac{\left(bd^3\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{142(bc-ad)^4g^4} + \frac{d^4\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{142(bc-ad)^4g^4} + \frac{\left(bd^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}}{142(bc-ad)^3g^4}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{142(bc-ad)^3g^4(a+bx}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{142(bc-ad)^3g^4(a+bx}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{142(bc-ad)^3g^4(a+bx}$$

$$= -\frac{Bn}{1278(bc-ad)g^4(a+bx)^3} + \frac{5Bdn}{1704(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2n}{852(bc-ad)^3g^4(a+b}$$

$$= -\frac{Bn}{1278(bc-ad)g^4(a+bx)^3} + \frac{5Bdn}{1704(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2n}{852(bc-ad)^3g^4(a+b}$$

$$= -\frac{Bn}{1278(bc-ad)g^4(a+bx)^3} + \frac{5Bdn}{1704(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2n}{852(bc-ad)^3g^4(a+b}$$

Mathematica [C] time = 0.754456, size = 518, normalized size = 1.33

$$-36Bd^3n\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right) - 36Bd^3n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right) + \frac{36Ad^2(ad-bc)}{a+bx} + \frac{18Ad(bc-ad)^2}{(a+bx)^2} - \frac{12A(bc-ad)^3}{(a+bx)^3} - 36Ad^3\log(a$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*
i*x)),x]
```

```
[Out] ((-12*A*(b*c - a*d)^3)/(a + b*x)^3 - (4*B*(b*c - a*d)^3*n)/(a + b*x)^3 + (1
8*A*d*(b*c - a*d)^2)/(a + b*x)^2 + (15*B*d*(b*c - a*d)^2*n)/(a + b*x)^2 + (
36*A*d^2*(-(b*c) + a*d))/(a + b*x) + (66*B*d^2*(-(b*c) + a*d)*n)/(a + b*x)
- 36*A*d^3*Log[a + b*x] - 66*B*d^3*n*Log[a + b*x] + 18*B*d^3*n*Log[a + b*x]
^2 - (12*B*(b*c - a*d)^3*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^3 + (18*
B*d*(b*c - a*d)^2*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^2 + (36*B*d^2*(
-(b*c) + a*d)*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x) - 36*B*d^3*Log[a +
b*x]*Log[e*((a + b*x)/(c + d*x))^n] + 36*A*d^3*Log[c + d*x] + 66*B*d^3*n*Lo
g[c + d*x] - 36*B*d^3*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 36
```

```
*B*d^3*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x] + 18*B*d^3*n*Log[c + d*x
]^2 - 36*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 36*B*d^3*n*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 36*B*d^3*n*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(36*(b*c - a*d)^4*g^4*i)
```

Maple [F] time = 0.773, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}\left(dix+ci\right)}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

Maxima [B] time = 1.79299, size = 1987, normalized size = 5.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] -1/6*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^
4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g
^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*
g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i)
+ 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*
b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d +
6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n) - 1/36*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*
a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^
2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3
*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*
c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x
 + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*
d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3
*d^3)*log(b*x + a))*log(d*x + c))*B*n/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*
g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^
7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d
^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^
4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*
x^2 + 3*(a^2*b^5*c^4*g^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*
i - 4*a^5*b^2*c*d^3*g^4*i + a^6*b*d^4*g^4*i)*x) - 1/6*A*((6*b^2*d^2*x^2 + 2
*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 -
3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3
*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3
- 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3
*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4
*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i)
- 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*
```

```
b*c*d^3 + a^4*d^4)*g^4*i))
```

Fricas [B] time = 0.599218, size = 1809, normalized size = 4.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] -1/36*(12*A*b^3*c^3 - 54*A*a*b^2*c^2*d + 108*A*a^2*b*c*d^2 - 66*A*a^3*d^3 +
 6*(6*A*b^3*c*d^2 - 6*A*a*b^2*d^3 + 11*(B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2 +
 18*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x + B*a^3*d^3*
n)*log((b*x + a)/(d*x + c))^2 + (4*B*b^3*c^3 - 27*B*a*b^2*c^2*d + 108*B*a^2
*b*c*d^2 - 85*B*a^3*d^3)*n - 3*(6*A*b^3*c^2*d - 36*A*a*b^2*c*d^2 + 30*A*a^2
*b*d^3 + (5*B*b^3*c^2*d - 54*B*a*b^2*c*d^2 + 49*B*a^2*b*d^3)*n)*x + 6*(2*B*
b^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2 - 11*B*a^3*d^3 + 6*(B*b^3*c*d^
2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x
+ 6*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x^2 + 3*B*a^2*b*d^3*x + B*a^3*d^3)*log((
b*x + a)/(d*x + c)))*log(e) + 6*(6*A*a^3*d^3 + (11*B*b^3*d^3*n + 6*A*b^3*d^
3)*x^3 + 3*(6*A*a*b^2*d^3 + (2*B*b^3*c*d^2 + 9*B*a*b^2*d^3)*n)*x^2 + (2*B*b
^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2)*n + 3*(6*A*a^2*b*d^3 - (B*b^3*
c^2*d - 6*B*a*b^2*c*d^2 - 6*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((
b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4
)*g^4*i*x^3 + 3*(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^
3*c*d^3 + a^5*b^2*d^4)*g^4*i*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4
*b^3*c^2*d^2 - 4*a^5*b^2*c*d^3 + a^6*b*d^4)*g^4*i*x + (a^3*b^4*c^4 - 4*a^4*
b^3*c^3*d + 6*a^5*b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{(bgx+ag)^4(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^4*(d*i*x +
c*i)), x)
```

3.143 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=359

$$-\frac{3bBg^3n(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^2}-\frac{g^3(a+bx)^2(bc-ad)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{2d^2i^2(c+dx)}-\frac{bg^3(bc-ad)^2\log\left(\frac{bc-}{b(c+}\right.}{}$$

```
[Out] (3*B*(b*c - a*d)^2*g^3*n*(a + b*x))/(d^3*i^2*(c + d*x)) - ((b*c - a*d)^2*g^
3*(6*A + 5*B*n)*(a + b*x))/(2*d^3*i^2*(c + d*x)) - (3*B*(b*c - a*d)^2*g^3*(
a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i^2*(c + d*x)) + (g^3*(a + b*
x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i^2*(c + d*x)) - ((b*c -
a*d)*g^3*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d
^2*i^2*(c + d*x)) - (b*(b*c - a*d)^2*g^3*(6*A + 5*B*n + 6*B*Log[e*((a + b*x
)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(2*d^4*i^2) - (3*b*B*(b*c
- a*d)^2*g^3*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2)
```

Rubi [A] time = 0.727243, antiderivative size = 541, normalized size of antiderivative = 1.51, number of steps used = 21, number of rules used = 14, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.326, Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{3bBg^3n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^4i^2}-\frac{a^2bBg^3n\log(a+bx)}{2d^2i^2}+\frac{b^3g^3x^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^2i^2}-\frac{Ab^2g^3x(2bc-3ad)}{d^3i^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
2,x]
```

```
[Out] -((A*b^2*(2*b*c - 3*a*d)*g^3*x)/(d^3*i^2)) - (b^2*B*(b*c - a*d)*g^3*n*x)/(2
*d^3*i^2) - (B*(b*c - a*d)^3*g^3*n)/(d^4*i^2*(c + d*x)) - (a^2*b*B*g^3*n*Lo
g[a + b*x])/(2*d^2*i^2) - (b*B*(b*c - a*d)^2*g^3*n*Log[a + b*x])/(d^4*i^2)
- (b*B*(2*b*c - 3*a*d)*g^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i
^2) + (b^3*g^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^2) + ((
b*c - a*d)^3*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^4*i^2*(c + d*x)
) + (b^3*B*c^2*g^3*n*Log[c + d*x])/(2*d^4*i^2) + (b*B*(2*b*c - 3*a*d)*(b*c
- a*d)*g^3*n*Log[c + d*x])/(d^4*i^2) + (b*B*(b*c - a*d)^2*g^3*n*Log[c + d*x
])/(d^4*i^2) - (3*b*B*(b*c - a*d)^2*g^3*n*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/(d^4*i^2) + (3*b*(b*c - a*d)^2*g^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])*Log[c + d*x])/(d^4*i^2) + (3*b*B*(b*c - a*d)^2*g^3*n*Log[c +
d*x]^2)/(2*d^4*i^2) - (3*b*B*(b*c - a*d)^2*g^3*n*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)])/(d^4*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(143c+143dx)^2}\,dx = \int\left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20449d^3}+\frac{b^3g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{20449d^2}\right.$$

$$=\frac{\left(b^3g^3\right)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{20449d^2}-\frac{\left(b^2(2bc-3ad)g^3\right)\int\left(A+B\log\left(e\right.\right.}{20449d^3}$$

$$=-\frac{Ab^2(2bc-3ad)g^3x}{20449d^3}+\frac{b^3g^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{40898d^2}+\frac{(bc-ad)^3g^3\left(A+\right.}{20449d}$$

$$=-\frac{Ab^2(2bc-3ad)g^3x}{20449d^3}-\frac{bB(2bc-3ad)g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{20449d^3}+\frac{b^3g^3x^2\left(\right.}{}$$

$$=-\frac{Ab^2(2bc-3ad)g^3x}{20449d^3}-\frac{bB(2bc-3ad)g^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{20449d^3}+\frac{b^3g^3x^2\left(\right.}{}$$

$$=-\frac{Ab^2(2bc-3ad)g^3x}{20449d^3}-\frac{b^2B(bc-ad)g^3nx}{40898d^3}-\frac{B(bc-ad)^3g^3n}{20449d^4(c+dx)}-\frac{a^2bBg^3n\log}{40898}$$

$$=-\frac{Ab^2(2bc-3ad)g^3x}{20449d^3}-\frac{b^2B(bc-ad)g^3nx}{40898d^3}-\frac{B(bc-ad)^3g^3n}{20449d^4(c+dx)}-\frac{a^2bBg^3n\log}{40898}$$

$$=-\frac{Ab^2(2bc-3ad)g^3x}{20449d^3}-\frac{b^2B(bc-ad)g^3nx}{40898d^3}-\frac{B(bc-ad)^3g^3n}{20449d^4(c+dx)}-\frac{a^2bBg^3n\log}{40898}$$

Mathematica [A] time = 0.440093, size = 375, normalized size = 1.04

$$\frac{g^3\left(-3bBn(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+bBn\left(b\left(dx(ad-bc)+bc^2\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x)^2,x]
```

```
[Out] (g^3*(-2*A*b^2*d*(2*b*c - 3*a*d)*x - 2*b*B*d*(2*b*c - 3*a*d)*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] + b^3*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]) + (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) +
 2*b*B*(2*b*c - 3*a*d)*(b*c - a*d)*n*Log[c + d*x] + 6*b*(b*c - a*d)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*(b*c - a*d)^2*n*((b*c
- a*d)/(c + d*x) + b*Log[a + b*x] - b*Log[c + d*x]) + b*B*n*(-(a^2*d^2*Log[
a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*b*B*(b*c - a*d
)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^4*i^2)
```

Maple [F] time = 0.66, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^3}{\left(dix+ci\right)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 2.63196, size = 2554, normalized size = 7.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] B*a^3*g^3*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*i^2)
 - b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) + 1/2*(2*c^3/(d^5*i^2*x + c*d^4*i^
2) + 6*c^2*log(d*x + c)/(d^4*i^2) + (d*x^2 - 4*c*x)/(d^3*i^2))*A*b^3*g^3 -
3*A*a*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x + c)/(d^
3*i^2))*g^3 + 3*A*a^2*b*g^3*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*
i^2)) - B*a^3*g^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^2*i^2*x + c*d*i
^2) - A*a^3*g^3/(d^2*i^2*x + c*d*i^2) - 1/2*(6*a^3*b*d^3*g^3*log(e) - (7*g^
3*n + 6*g^3*log(e))*b^4*c^3 + (17*g^3*n + 18*g^3*log(e))*a*b^3*c^2*d - 6*(2
*g^3*n + 3*g^3*log(e))*a^2*b^2*c*d^2)*B*log(d*x + c)/(b*c*d^4*i^2 - a*d^5*i
^2) + 1/2*((b^4*c*d^3*g^3*log(e) - a*b^3*d^4*g^3*log(e))*B*x^3 - ((g^3*n +
3*g^3*log(e))*b^4*c^2*d^2 - (2*g^3*n + 9*g^3*log(e))*a*b^3*c*d^3 + (g^3*n +
```

```
 6*g^3*log(e))*a^2*b^2*d^4)*B*x^2 - ((g^3*n + 4*g^3*log(e))*b^4*c^3*d - 2*(
g^3*n + 5*g^3*log(e))*a*b^3*c^2*d^2 + (g^3*n + 6*g^3*log(e))*a^2*b^2*c*d^3)
*B*x - 6*((b^4*c^3*d*g^3*n - 3*a*b^3*c^2*d^2*g^3*n + 3*a^2*b^2*c*d^3*g^3*n
- a^3*b*d^4*g^3*n)*B*x + (b^4*c^4*g^3*n - 3*a*b^3*c^3*d*g^3*n + 3*a^2*b^2*c
^2*d^2*g^3*n - a^3*b*c*d^3*g^3*n)*B)*log(b*x + a)*log(d*x + c) + 3*((b^4*c^
3*d*g^3*n - 3*a*b^3*c^2*d^2*g^3*n + 3*a^2*b^2*c*d^3*g^3*n - a^3*b*d^4*g^3*n
)*B*x + (b^4*c^4*g^3*n - 3*a*b^3*c^3*d*g^3*n + 3*a^2*b^2*c^2*d^2*g^3*n - a^
3*b*c*d^3*g^3*n)*B)*log(d*x + c)^2 - 2*((g^3*n - g^3*log(e))*b^4*c^4 - 4*(g
^3*n - g^3*log(e))*a*b^3*c^3*d + 6*(g^3*n - g^3*log(e))*a^2*b^2*c^2*d^2 - 3
*(g^3*n - g^3*log(e))*a^3*b*c*d^3)*B - ((2*b^4*c^3*d*g^3*n - 2*a*b^3*c^2*d^
2*g^3*n - 3*a^2*b^2*c*d^3*g^3*n + 5*a^3*b*d^4*g^3*n)*B*x + (2*b^4*c^4*g^3*n
 - 2*a*b^3*c^3*d*g^3*n - 3*a^2*b^2*c^2*d^2*g^3*n + 5*a^3*b*c*d^3*g^3*n)*B)*
log(b*x + a) + ((b^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2*d^2*g^3
- 3*a*b^3*c*d^3*g^3 + 2*a^2*b^2*d^4*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g^3 - 5*a*b
^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3)*B*x + 2*(b^4*c^4*g^3 - 4*a*b^3*c^3*d*
g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 3*a^3*b*c*d^3*g^3)*B + 6*((b^4*c^3*d*g^3 - 3*
a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3 - a^3*b*d^4*g^3)*B*x + (b^4*c^4*g^3
 - 3*a*b^3*c^3*d*g^3 + 3*a^2*b^2*c^2*d^2*g^3 - a^3*b*c*d^3*g^3)*B)*log(d*x
+ c))*log((b*x + a)^n) - ((b^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^
2*d^2*g^3 - 3*a*b^3*c*d^3*g^3 + 2*a^2*b^2*d^4*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g
^3 - 5*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3)*B*x + 2*(b^4*c^4*g^3 - 4*a*
b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 3*a^3*b*c*d^3*g^3)*B + 6*((b^4*c^3*
d*g^3 - 3*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3 - a^3*b*d^4*g^3)*B*x + (b
^4*c^4*g^3 - 3*a*b^3*c^3*d*g^3 + 3*a^2*b^2*c^2*d^2*g^3 - a^3*b*c*d^3*g^3)*B
)*log(d*x + c))*log((d*x + c)^n))/(b*c^2*d^4*i^2 - a*c*d^5*i^2 + (b*c*d^5*i
^2 - a*d^6*i^2)*x) + 3*(b^3*c^2*g^3*n - 2*a*b^2*c*d*g^3*n + a^2*b*d^2*g^3*n
)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(
b*c - a*d)))*B/(d^4*i^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^3g^3x^3 + 3\,Aab^2g^3x^2 + 3\,Aa^2bg^3x + Aa^3g^3 + \left(Bb^3g^3x^3 + 3\,Bab^2g^3x^2 + 3\,Ba^2bg^3x + Ba^3g^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2},$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3 +
 (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log(e*((
b*x + a)/(d*x + c))^n))/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left(B \log\left(e \left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{(dix + ci)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c
*i)^2, x)
```

3.144 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=275

$$\frac{2bBg^2n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}+\frac{bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+Bn\right)}{d^3i^2}+\frac{g^2(a+bx)(2A+Bn}{d^2i^2(c+dx}$$

```
[Out] (-2*B*(b*c - a*d)*g^2*n*(a + b*x))/(d^2*i^2*(c + d*x)) + ((b*c - a*d)*g^2*(
2*A + B*n)*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B*(b*c - a*d)*g^2*(a + b*x)*
Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^2*(c + d*x)) + (g^2*(a + b*x)^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(d*i^2*(c + d*x)) + (b*(b*c - a*d)*g^2*
(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*
x))])/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^2*n*PolyLog[2, (d*(a + b*x))/(b*(c +
 d*x))])/(d^3*i^2)
```

Rubi [A] time = 0.532204, antiderivative size = 351, normalized size of antiderivative = 1.28, number of steps used = 17, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2bBg^2n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^3i^2}-\frac{g^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^2(c+dx)}-\frac{2bg^2(bc-ad)\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{d^3i^2}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
2,x]
```

```
[Out] (A*b^2*g^2*x)/(d^2*i^2) + (B*(b*c - a*d)^2*g^2*n)/(d^3*i^2*(c + d*x)) + (b*
B*(b*c - a*d)*g^2*n*Log[a + b*x])/(d^3*i^2) + (b*B*g^2*(a + b*x)*Log[e*((a
+ b*x)/(c + d*x))^n])/(d^2*i^2) - ((b*c - a*d)^2*g^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(d^3*i^2*(c + d*x)) - (2*b*B*(b*c - a*d)*g^2*n*Log[c + d*
x])/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*
Log[c + d*x])/(d^3*i^2) - (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])*Log[c + d*x])/(d^3*i^2) - (b*B*(b*c - a*d)*g^2*n*Log[c + d*x]^2)
/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
)/(d^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(144c+144dx)^2}\,dx = \int\left(\frac{b^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20736d^2}+\frac{(-bc+ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20736d^2(c+dx)^2}-\right.$$

$$=\frac{\left(b^2g^2\right)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{20736d^2}-\frac{\left(b(bc-ad)g^2\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{10368d^2}$$

$$=\frac{Ab^2g^2x}{20736d^2}-\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20736d^3(c+dx)}-\frac{b(bc-ad)g^2\left(A+B\log\right.}{1036}$$

$$=\frac{Ab^2g^2x}{20736d^2}+\frac{bBg^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{20736d^2}-\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{20736d^3(c+dx)}$$

$$=\frac{Ab^2g^2x}{20736d^2}+\frac{bBg^2(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{20736d^2}-\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{20736d^3(c+dx)}$$

$$=\frac{Ab^2g^2x}{20736d^2}+\frac{B(bc-ad)^2g^2n}{20736d^3(c+dx)}+\frac{bB(bc-ad)g^2n\log(a+bx)}{20736d^3}+\frac{bBg^2(a+bx)}{207}$$

$$=\frac{Ab^2g^2x}{20736d^2}+\frac{B(bc-ad)^2g^2n}{20736d^3(c+dx)}+\frac{bB(bc-ad)g^2n\log(a+bx)}{20736d^3}+\frac{bBg^2(a+bx)}{207}$$

$$=\frac{Ab^2g^2x}{20736d^2}+\frac{B(bc-ad)^2g^2n}{20736d^3(c+dx)}+\frac{bB(bc-ad)g^2n\log(a+bx)}{20736d^3}+\frac{bBg^2(a+bx)}{207}$$

Mathematica [A] time = 0.258648, size = 252, normalized size = 0.92

$$g^2\left(bBn(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2b(bc-ad)\log(c+dx)\left(B\log\left(e\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + dx))^n]))/(c*i + d
*i*x)^2,x]
```

```
[Out] (g^2*(A*b^2*d*x + (B*(b*c - a*d)^2*n)/(c + d*x) + b*B*(b*c - a*d)*n*Log[a +
 b*x] + b*B*d*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - ((b*c - a*d)^2*(A
```

```
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 2*b*B*(b*c - a*d)*n*Log[c
+ d*x] - 2*b*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x
] + b*B*(b*c - a*d)*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])
*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(d^3*i^2)
```

Maple [F] time = 0.695, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{2}}{\left(dix+ci\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)

[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 2.57898, size = 1719, normalized size = 6.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="maxima")

[Out] B*a^2*g^2*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*i^2)
 - b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A*b^2*(c^2/(d^4*i^2*x + c*d^3*i^
2) - x/(d^2*i^2) + 2*c*log(d*x + c)/(d^3*i^2))*g^2 + 2*A*a*b*g^2*(c/(d^3*i^
2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i^2)) - B*a^2*g^2*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n)/(d^2*i^2*x + c*d*i^2) - A*a^2*g^2/(d^2*i^2*x + c*d*i^2)
- (2*a^2*b*d^2*g^2*log(e) + 2*(g^2*n + g^2*log(e))*b^3*c^2 - (3*g^2*n + 4*g
^2*log(e))*a*b^2*c*d)*B*log(d*x + c)/(b*c*d^3*i^2 - a*d^4*i^2) + ((b^3*c*d^
2*g^2*log(e) - a*b^2*d^3*g^2*log(e))*B*x^2 + (b^3*c^2*d*g^2*log(e) - a*b^2*
c*d^2*g^2*log(e))*B*x + 2*((b^3*c^2*d*g^2*n - 2*a*b^2*c*d^2*g^2*n + a^2*b*d
^3*g^2*n)*B*x + (b^3*c^3*g^2*n - 2*a*b^2*c^2*d*g^2*n + a^2*b*c*d^2*g^2*n)*B
)*log(b*x + a)*log(d*x + c) - ((b^3*c^2*d*g^2*n - 2*a*b^2*c*d^2*g^2*n + a^2
*b*d^3*g^2*n)*B*x + (b^3*c^3*g^2*n - 2*a*b^2*c^2*d*g^2*n + a^2*b*c*d^2*g^2*
n)*B)*log(d*x + c)^2 + ((g^2*n - g^2*log(e))*b^3*c^3 - 3*(g^2*n - g^2*log(e
))*a*b^2*c^2*d + 2*(g^2*n - g^2*log(e))*a^2*b*c*d^2)*B + ((b^3*c^2*d*g^2*n
- a*b^2*c*d^2*g^2*n - a^2*b*d^3*g^2*n)*B*x + (b^3*c^3*g^2*n - a*b^2*c^2*d*g
^2*n - a^2*b*c*d^2*g^2*n)*B)*log(b*x + a) + ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2
)*B*x^2 + (b^3*c^2*d*g^2 - a*b^2*c*d^2*g^2)*B*x - (b^3*c^3*g^2 - 3*a*b^2*c^
2*d*g^2 + 2*a^2*b*c*d^2*g^2)*B - 2*((b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 + a^
2*b*d^3*g^2)*B*x + (b^3*c^3*g^2 - 2*a*b^2*c^2*d*g^2 + a^2*b*c*d^2*g^2)*B)*l
og(d*x + c))*log((b*x + a)^n) - ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (b
^3*c^2*d*g^2 - a*b^2*c*d^2*g^2)*B*x - (b^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 2*
a^2*b*c*d^2*g^2)*B - 2*((b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 + a^2*b*d^3*g^2)
*B*x + (b^3*c^3*g^2 - 2*a*b^2*c^2*d*g^2 + a^2*b*c*d^2*g^2)*B)*log(d*x + c))
*log((d*x + c)^n))/(b*c^2*d^3*i^2 - a*c*d^4*i^2 + (b*c*d^4*i^2 - a*d^5*i^2)
*x) - 2*(b^2*c*g^2*n - a*b*d*g^2*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^3*i^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^2g^2x^2 + 2\,Aabg^2x + Aa^2g^2 + \left(Bb^2g^2x^2 + 2\,Babg^2x + Ba^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*
a*b*g^2*x + B*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^n))/(d^2*i^2*x^2 + 2*c*d
*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{(dix + ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c
*i)^2, x)
```

3.145 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=168

$$-\frac{bBgn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^2}-\frac{Ag(a+bx)}{di^2(c+dx)}-\frac{Bg(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{di^2(c+dx)}+$$

```
[Out] -((A*g*(a + b*x))/(d*i^2*(c + d*x))) + (B*g*n*(a + b*x))/(d*i^2*(c + d*x))
- (B*g*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d*i^2*(c + d*x)) - (b*g*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^2*
i^2) - (b*B*g*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i^2)
```

Rubi [A] time = 0.38688, antiderivative size = 234, normalized size of antiderivative = 1.39, number of steps used = 14, number of rules used = 11, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.268, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{bBgn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2i^2}+\frac{bg\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^2}+\frac{g(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^2(c+dx)}-\frac{Bgn(bc}{d^2i^2(c}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^2,
x]
```

```
[Out] -((B*(b*c - a*d)*g*n)/(d^2*i^2*(c + d*x))) - (b*B*g*n*Log[a + b*x])/(d^2*i^
2) + ((b*c - a*d)*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2*(c + d
*x)) + (b*B*g*n*Log[c + d*x])/(d^2*i^2) - (b*B*g*n*Log[-((d*(a + b*x))/(b*c
 - a*d))]*Log[c + d*x])/(d^2*i^2) + (b*g*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[c + d*x])/(d^2*i^2) + (b*B*g*n*Log[c + d*x]^2)/(2*d^2*i^2) - (b*B*
g*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(145c+145dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d(c+dx)^2} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d(c+dx)}\right) d$$

$$= \frac{(bg)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{21025d} - \frac{((bc-ad)g)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}dx}{21025d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+d}{21025d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+d}{21025d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21025d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+d}{21025d^2}$$

$$= -\frac{B(bc-ad)gn}{21025d^2(c+dx)} - \frac{bBgn\log(a+bx)}{21025d^2} + \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{21025d^2(c+dx)}$$

$$= -\frac{B(bc-ad)gn}{21025d^2(c+dx)} - \frac{bBgn\log(a+bx)}{21025d^2} + \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{21025d^2(c+dx)}$$

$$= -\frac{B(bc-ad)gn}{21025d^2(c+dx)} - \frac{bBgn\log(a+bx)}{21025d^2} + \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{21025d^2(c+dx)}$$

Mathematica [A] time = 0.178794, size = 183, normalized size = 1.09

$$\frac{g\left(-bBn\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2b\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right.\right.}{2d^2i^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i
*x)^2,x]
```

```
[Out] (g*((2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 2*b*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*n*((b*c - a*d)/(c
 + d*x) + b*Log[a + b*x] - b*Log[c + d*x]) - b*B*n*((2*Log[(d*(a + b*x))/(-
(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])))/(2*d^2*i^2)
```

Maple [F] time = 0.514, size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$Bagn\left(\frac{1}{d^2i^2x+cdi^2}+\frac{b\log(bx+a)}{(bcd-ad^2)i^2}-\frac{b\log(dx+c)}{(bcd-ad^2)i^2}\right)-\frac{1}{2}Bbg\left(\frac{2(dnx+cn)\log(bx+a)\log(dx+c)-(dnx+cn)\log(dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] B*a*g*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*i^2) - b
*log(d*x + c)/((b*c*d - a*d^2)*i^2)) - 1/2*B*b*g*((2*(d*n*x + c*n)*log(b*x
+ a)*log(d*x + c) - (d*n*x + c*n)*log(d*x + c)^2 - 2*((d*x + c)*log(d*x + c
) + c)*log((b*x + a)^n) + 2*((d*x + c)*log(d*x + c) + c)*log((d*x + c)^n))/
(d^3*i^2*x + c*d^2*i^2) - 2*integrate((b*d^2*x^2*log(e) + a*d^2*x*log(e) -
b*c^2*n + a*c*d*n + (b*d^2*n*x^2 + a*c*d*n + (b*c*d*n + a*d^2*n)*x)*log(b*x
 + a))/(b*d^4*i^2*x^3 + a*c^2*d^2*i^2 + (2*b*c*d^3*i^2 + a*d^4*i^2)*x^2 + (
b*c^2*d^2*i^2 + 2*a*c*d^3*i^2)*x), x)) + A*b*g*(c/(d^3*i^2*x + c*d^2*i^2) +
 log(d*x + c)/(d^2*i^2)) - B*a*g*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^
2*i^2*x + c*d*i^2) - A*a*g/(d^2*i^2*x + c*d*i^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{Abgx+Aag+(Bbgx+Bag)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^2i^2x^2+2\,cdi^2x+c^2i^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] integral((A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log(e*((b*x + a)/(d*x + c))^n
))/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}{(dix + ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i
)^2, x)
```

3.146 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dix)^2}\,dx$

Optimal. Leaf size=102

$$\frac{A(a+bx)}{i^2(c+dx)(bc-ad)}+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{i^2(c+dx)(bc-ad)}-\frac{Bn(a+bx)}{i^2(c+dx)(bc-ad)}$$

```
[Out] (A*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) - (B*n*(a + b*x))/((b*c - a*d)*i^
2*(c + d*x)) + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*i^
2*(c + d*x))
```

Rubi [A] time = 0.078694, antiderivative size = 107, normalized size of antiderivative = 1.05, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{di^2(c+dx)}+\frac{bBn\log(a+bx)}{di^2(bc-ad)}-\frac{bBn\log(c+dx)}{di^2(bc-ad)}+\frac{Bn}{di^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^2,x]
```

```
[Out] (B*n)/(d*i^2*(c + d*x)) + (b*B*n*Log[a + b*x])/(d*(b*c - a*d)*i^2) - (A + B
*Log[e*((a + b*x)/(c + d*x))^n])/(d*i^2*(c + d*x)) - (b*B*n*Log[c + d*x])/(
d*(b*c - a*d)*i^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(146c+146dx)^2}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} + \frac{(Bn)\int \frac{bc-ad}{146(a+bx)(c+dx)^2}\,dx}{146d}$$
$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)^2}\,dx}{21316d}$$
$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} + \frac{(B(bc-ad)n)\int \left(\frac{b^2}{(bc-ad)^2(a+bx)} - \frac{d}{(bc-ad)(c+dx)^2} - \frac{bd}{(bc-ad)^2(c+dx)}\right)}{21316d}$$
$$= \frac{Bn}{21316d(c+dx)} + \frac{bBn\log(a+bx)}{21316d(bc-ad)} - \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c+dx)} - \frac{bBn\log(c+dx)}{21316d(bc-ad)}$$

Mathematica [A] time = 0.0528881, size = 114, normalized size = 1.12

$$\frac{Bn(bc-ad)\left(\frac{1}{(c+dx)(bc-ad)} + \frac{b\log(a+bx)}{(bc-ad)^2} - \frac{b\log(c+dx)}{(bc-ad)^2}\right)}{di^2} - \frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{di(ci+dix)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^2,x]
```

```
[Out] -((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(d*i*(c*i + d*i*x))) + (B*(b*c - a
*d)*n*(1/((b*c - a*d)*(c + d*x)) + (b*Log[a + b*x])/(b*c - a*d)^2 - (b*Log[
c + d*x])/(b*c - a*d)^2))/(d*i^2)
```

Maple [F] time = 0.518, size = 0, normalized size = 0.

$$\int \frac{1}{(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x)
```

Maxima [A] time = 1.16073, size = 184, normalized size = 1.8

$$Bn\left(\frac{1}{d^2i^2x+cdi^2} + \frac{b\log(bx+a)}{\left(bcd-ad^2\right)i^2} - \frac{b\log(dx+c)}{\left(bcd-ad^2\right)i^2}\right) - \frac{B\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)}{d^2i^2x+cdi^2} - \frac{A}{d^2i^2x+cdi^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, algorithm="maxi
ma")
```

```
[Out] B*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*i^2) - b*log
(d*x + c)/((b*c*d - a*d^2)*i^2)) - B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
/(d^2*i^2*x + c*d*i^2) - A/(d^2*i^2*x + c*d*i^2)
```

Fricas [A] time = 0.507928, size = 221, normalized size = 2.17

$$-\frac{Abc - Aad - (Bbc - Bad)n + (Bbc - Bad)\log(e) - (Bbdnx + Badn)\log\left(\frac{bx+a}{dx+c}\right)}{\left(bcd^2 - ad^3\right)i^2x + \left(bc^2d - acd^2\right)i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, algorithm="fric
as")
```

```
[Out] -(A*b*c - A*a*d - (B*b*c - B*a*d)*n + (B*b*c - B*a*d)*log(e) - (B*b*d*n*x +
 B*a*d*n)*log((b*x + a)/(d*x + c)))/((b*c*d^2 - a*d^3)*i^2*x + (b*c^2*d - a
*c*d^2)*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.79707, size = 134, normalized size = 1.31

$$-\frac{Bbn\log(bx+a)}{bcd - ad^2} + \frac{Bbn\log(dx+c)}{bcd - ad^2} + \frac{Bn\log\left(\frac{bx+a}{dx+c}\right)}{d^2x + cd} - \frac{Bn - A - B}{d^2x + cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, algorithm="giac
")
```

```
[Out] -B*b*n*log(b*x + a)/(b*c*d - a*d^2) + B*b*n*log(d*x + c)/(b*c*d - a*d^2) +
B*n*log((b*x + a)/(d*x + c))/(d^2*x + c*d) - (B*n - A - B)/(d^2*x + c*d)
```

3.147 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=166

$$\frac{b\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2Bgi^2n(bc-ad)^2}-\frac{Ad(a+bx)}{gi^2(c+dx)(bc-ad)^2}-\frac{Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi^2(c+dx)(bc-ad)^2}+\frac{Bdn(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

```
[Out] -((A*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x))) + (B*d*n*(a + b*x))/((b*
c - a*d)^2*g*i^2*(c + d*x)) - (B*d*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n]
)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2)/(2*B*(b*c - a*d)^2*g*i^2*n)
```

Rubi [C] time = 0.678837, antiderivative size = 450, normalized size of antiderivative = 2.71, number of steps used = 22, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 12, 44}

$$\frac{bBn\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{gi^2(bc-ad)^2}+\frac{bBn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{gi^2(bc-ad)^2}+\frac{b\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{gi^2(bc-ad)^2}+\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+}{gi^2(c+dx)(bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*x)^2),
x]
```

```
[Out] -((B*n)/((b*c - a*d)*g*i^2*(c + d*x))) - (b*B*n*Log[a + b*x])/((b*c - a*d)^
2*g*i^2) - (b*B*n*Log[a + b*x]^2)/(2*(b*c - a*d)^2*g*i^2) + (A + B*Log[e*((
a + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i^2*(c + d*x)) + (b*Log[a + b*x]*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g*i^2) + (b*B*n*Log[c +
 d*x])/((b*c - a*d)^2*g*i^2) + (b*B*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log
[c + d*x])/((b*c - a*d)^2*g*i^2) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (b*B*n*Log[c + d*x]^2)/(2*(b*c - a*
d)^2*g*i^2) + (b*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a
*d)^2*g*i^2) + (b*B*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d
)^2*g*i^2) + (b*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g
*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(147c+147dx)^2(ag+bgx)}dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)g(c+dx)^2} - \frac{bd\left(A+B\log\left(e\left(\frac{a\cdots}{c\cdots}\right.\right.\right.}{21609(bc-ad)^2g(\cdots}\right.$$

$$= \frac{b^2\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{21609(bc-ad)^2g} - \frac{(bd)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{21609(bc-ad)^2g} - \frac{d\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}dx}{21609(bc-ad)g}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g} - \frac{b\left(A+B\log\left(\cdots\right.\right.}{216\cdots}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g} - \frac{b\left(A+B\log\left(\cdots\right.\right.}{216\cdots}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc-ad)^2g} - \frac{b\left(A+B\log\left(\cdots\right.\right.}{216\cdots}$$

$$= -\frac{Bn}{21609(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)}{21609(bc-ad)^2g} + \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc-ad)g(c+dx)} + \frac{b\log\cdots}{\cdots}$$

$$= -\frac{Bn}{21609(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)}{21609(bc-ad)^2g} - \frac{bBn\log^2(a+bx)}{43218(bc-ad)^2g} + \frac{A+B\log\cdots}{21609(bc-\cdots}$$

$$= -\frac{Bn}{21609(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)}{21609(bc-ad)^2g} - \frac{bBn\log^2(a+bx)}{43218(bc-ad)^2g} + \frac{A+B\log\cdots}{21609(bc-\cdots}$$

Mathematica [C] time = 0.313787, size = 304, normalized size = 1.83

$$\frac{-bBn(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bBn(c+dx)\left(2\text{PolyLog}\left(2,\frac{b(c+d\cdots}{bc-a\cdots}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*
x)^2),x]
```

```
[Out] (2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Lo
g[a + b*x] - b*(c + d*x)*Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log
[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/
(-(b*c) + a*d)]) + b*B*n*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*(
b*c - a*d)^2*g*i^2*(c + d*x))
```

Maple [F] time = 0.762, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 1.29679, size = 572, normalized size = 3.45

$$B\left(\frac{1}{\left(bcd-ad^2\right)gi^2x+\left(bc^2-acd\right)gi^2}+\frac{b\log\left(bx+a\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)gi^2}-\frac{b\log\left(dx+c\right)}{\left(b^2c^2-2\,abcd+a^2d^2\right)gi^2}\right)\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, alg
orithm="maxima")
```

```
[Out] B*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b
^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d
 + a^2*d^2)*g*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/2*((b*d*x +
b*c)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d
*x + b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d
*x + c))*B*n/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^
2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x) + A*(1/((b*c*d - a*d^2)*g
*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^
2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2))
```

Fricas [A] time = 0.52912, size = 444, normalized size = 2.67

$$\frac{2\,Abc-2\,Aad+\left(Bbdnx+Bbcn\right)\log\left(\frac{bx+a}{dx+c}\right)^2-2\left(Bbc-Bad\right)n+2\left(Bbc-Bad+\left(Bbdx+Bbc\right)\log\left(\frac{bx+a}{dx+c}\right)\right)\log\left(e\right)-2\left(Ba\right.}{2\left(\left(b^2c^2d-2\,abcd^2+a^2d^3\right)gi^2x+\left(b^2c^3-2\,abc^2d+a^2cd^2\right)gi^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] 1/2*(2*A*b*c - 2*A*a*d + (B*b*d*n*x + B*b*c*n)*log((b*x + a)/(d*x + c))^2 -
 2*(B*b*c - B*a*d)*n + 2*(B*b*c - B*a*d + (B*b*d*x + B*b*c)*log((b*x + a)/(
d*x + c)))*log(e) - 2*(B*a*d*n - A*b*c + (B*b*d*n - A*b*d)*x)*log((b*x + a)
/(d*x + c)))/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g*i^2*x + (b^2*c^3 - 2*a*
b*c^2*d + a^2*c*d^2)*g*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(bgx+ag\right)(dix+ci)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, alg
orithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)*(d*i*x + c*
i)^2), x)
```

3.148 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=273

$$-\frac{b^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(c+dx)(bc-ad)^3}-\frac{2bd\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(bc-ad)^3}-\frac{}{g^2}$$

```
[Out] -((B*d^2*n*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x))) - (b^2*B*n*(c + d*
x))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (d^2*(a + b*x)*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (b^2*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*
b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c
- a*d)^3*g^2*i^2) + (b*B*d*n*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^3*g^2
*i^2)
```

Rubi [C] time = 0.829938, antiderivative size = 482, normalized size of antiderivative = 1.77, number of steps used = 26, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2bBdn\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3}-\frac{2bBdn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3}-\frac{2bd\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(bc-ad)^3}-\frac{b\left(B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{g^2i^2(a+bx)(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)^2
),x]
```

```
[Out] -((b*B*n)/((b*c - a*d)^2*g^2*i^2*(a + b*x))) + (B*d*n)/((b*c - a*d)^2*g^2*i
^2*(c + d*x)) + (b*B*d*n*Log[a + b*x]^2)/((b*c - a*d)^3*g^2*i^2) - (b*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (d*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^2*i^2*(c + d*x)) -
(2*b*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*
g^2*i^2) - (2*b*B*d*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c
 - a*d)^3*g^2*i^2) + (2*b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x])/((b*c - a*d)^3*g^2*i^2) + (b*B*d*n*Log[c + d*x]^2)/((b*c - a*d)^3*g^2
*i^2) - (2*b*B*d*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d
)^3*g^2*i^2) - (2*b*B*d*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c -
 a*d)^3*g^2*i^2) - (2*b*B*d*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c
- a*d)^3*g^2*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(148c+148dx)^2(ag+bgx)^2}\,dx = \int\left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)^2} - \frac{b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{10952(bc-ad)^3g^2(a+bx)} + \frac{d^2\left(A+B\log\left(e\left(\right.\right.\right.}{21904(bc-ad)^2g^2}\right.$$

$$= -\frac{\left(b^2d\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{10952(bc-ad)^3g^2} + \frac{\left(bd^2\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{10952(bc-ad)^3g^2} + \frac{b^2\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}\,dx}{21904(bc-ad)^2g^2}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx)\left(A+B\,\mathrm{l}\right.}{10952(bc-a}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx)\left(A+B\,\mathrm{l}\right.}{10952(bc-a}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc-ad)^2g^2(c+dx)} - \frac{bd\log(a+bx)\left(A+B\,\mathrm{l}\right.}{10952(bc-a}$$

$$= -\frac{bBn}{21904(bc-ad)^2g^2(a+bx)} + \frac{Bdn}{21904(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{21904(bc-ad)^2g^2(a+}$$

$$= -\frac{bBn}{21904(bc-ad)^2g^2(a+bx)} + \frac{Bdn}{21904(bc-ad)^2g^2(c+dx)} + \frac{bBdn\log^2(a+bx)}{21904(bc-ad)^3g^2} - \frac{b}{2}$$

$$= -\frac{bBn}{21904(bc-ad)^2g^2(a+bx)} + \frac{Bdn}{21904(bc-ad)^2g^2(c+dx)} + \frac{bBdn\log^2(a+bx)}{21904(bc-ad)^3g^2} - \frac{b}{2}$$

Mathematica [C] time = 0.476942, size = 342, normalized size = 1.25

$$\frac{bBdn\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-bBdn\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*
i*x)^2),x]
```

```
[Out] (-((b^2*B*c*n)/(a + b*x)) + (a*b*B*d*n)/(a + b*x) + (b*B*c*d*n)/(c + d*x) -
 (a*B*d^2*n)/(c + d*x) - (b*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]))/(a + b*x) + (d*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(c + d*x) - 2*b*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b
*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + b*B*d*n*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) - b*B*d*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*
c - a*d)^3*g^2*i^2)
```

Maple [F] time = 0.746, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx + ag\right)^2 (dix + ci)^2} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 1.38429, size = 1164, normalized size = 4.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^2*
x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*c^
3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*
a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^3*
c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2))*log(e*(b*x/(d*x +
c) + a/(d*x + c))^n) - (b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*
c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b
^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (
b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*B*n/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^
3*d*g^2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*
i^2 - 3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2
)*x^2 + (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 -
a^4*d^4*g^2*i^2)*x) - A*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2
+ a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*
g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*
x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*
d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2
))
```

Fricas [A] time = 0.552019, size = 932, normalized size = 3.41

$$-\frac{Ab^2c^2 - Aa^2d^2 + \left(Bb^2d^2nx^2 + Babcdn + \left(Bb^2cd + Babd^2\right)nx\right)\log\left(\frac{bx+a}{dx+c}\right)^2 + \left(Bb^2c^2 - 2\,Babcd + Ba^2d^2\right)n + 2\left(Ab^2cd\right.}{\left(b^4c^3d - 3\,ab^3c^2d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] -(A*b^2*c^2 - A*a^2*d^2 + (B*b^2*d^2*n*x^2 + B*a*b*c*d*n + (B*b^2*c*d + B*a
*b*d^2)*n*x)*log((b*x + a)/(d*x + c))^2 + (B*b^2*c^2 - 2*B*a*b*c*d + B*a^2*
d^2)*n + 2*(A*b^2*c*d - A*a*b*d^2)*x + (B*b^2*c^2 - B*a^2*d^2 + 2*(B*b^2*c*
```

```
d - B*a*b*d^2)*x + 2*(B*b^2*d^2*x^2 + B*a*b*c*d + (B*b^2*c*d + B*a*b*d^2)*x
)*log((b*x + a)/(d*x + c)))*log(e) + (2*A*b^2*d^2*x^2 + 2*A*a*b*c*d + (B*b^
2*c^2 - B*a^2*d^2)*n + 2*(A*b^2*c*d + A*a*b*d^2 + (B*b^2*c*d - B*a*b*d^2)*n
)*x)*log((b*x + a)/(d*x + c)))/((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*
d^3 - a^3*b*d^4)*g^2*i^2*x^2 + (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a
^4*d^4)*g^2*i^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*
d^3)*g^2*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(bgx+ag\right)^{2}(dix+ci)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^2*(d*i*x +
c*i)^2), x)
```

3.149 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=380

$$-\frac{b^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^2(a+bx)(bc-ad)^4}+\frac{3bd^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^2(bc-ad)^4}$$

```
[Out] (B*d^3*n*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*B*d*n*(c + d
*x))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*n*(c + d*x)^2)/(4*(b*c - a*
d)^4*g^3*i^2*(a + b*x)^2) - (d^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d
*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^3*i^2*(a +
 b*x)^2) + (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c
 + d*x)])/((b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*n*Log[(a + b*x)/(c + d*x)]^2
)/(2*(b*c - a*d)^4*g^3*i^2)
```

Rubi [C] time = 1.08723, antiderivative size = 656, normalized size of antiderivative = 1.73, number of steps used = 30, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3bBd^2n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4}+\frac{3bBd^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4}+\frac{3bd^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^2(bc-ad)^4}+\frac{d^2\left(B\log\right.}{g^3i^2(c}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)^2
),x]
```

```
[Out] -(b*B*n)/(4*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (5*b*B*d*n)/(2*(b*c - a*d)
^3*g^3*i^2*(a + b*x)) - (B*d^2*n)/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*
B*d^2*n*Log[a + b*x])/(2*(b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*n*Log[a + b*x]
^2)/(2*(b*c - a*d)^4*g^3*i^2) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (2*b*d*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/((b*c - a*d)^3*g^3*i^2*(a + b*x)) + (d^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*d^2*Log[a + b*x]
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^2) - (3*b*B*d
^2*n*Log[c + d*x])/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*n*Log[-((d*(a + b
*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*d^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*
b*B*d^2*n*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*n*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*n
*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (3*b*B
*d^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(149c+149dx)^2(ag+bgx)^3}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^2g^3(a+bx)^3} - \frac{2b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d^2\left(A+B\right.}{22201(bc-\right.}$$

$$= \frac{\left(3b^2d^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{22201(bc-ad)^4g^3} - \frac{\left(3bd^3\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{22201(bc-ad)^4g^3} - \frac{\left(2b^2d\right)\int \frac{A+B\log(e}{(a+b}}{22201(bc-a}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(e\right.\right.}{22201(bc-ad)^3g}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(e\right.\right.}{22201(bc-ad)^3g}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc-ad)^2g^3(a+bx)^2} + \frac{2bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc-ad)^3g^3(a+bx)} + \frac{d^2\left(A+B\log\left(e\right.\right.}{22201(bc-ad)^3g}$$

$$= -\frac{bBn}{88804(bc-ad)^2g^3(a+bx)^2} + \frac{5bBdn}{44402(bc-ad)^3g^3(a+bx)} - \frac{Bd^2n}{22201(bc-ad)^3g^3}$$

$$= -\frac{bBn}{88804(bc-ad)^2g^3(a+bx)^2} + \frac{5bBdn}{44402(bc-ad)^3g^3(a+bx)} - \frac{Bd^2n}{22201(bc-ad)^3g^3}$$

$$= -\frac{bBn}{88804(bc-ad)^2g^3(a+bx)^2} + \frac{5bBdn}{44402(bc-ad)^3g^3(a+bx)} - \frac{Bd^2n}{22201(bc-ad)^3g^3}$$

Mathematica [C] time = 0.844032, size = 478, normalized size = 1.26

$$\frac{-6bBd^2n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+6bBd^2n\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*
i*x)^2),x]
```

```
[Out] (-((b*B*(b*c - a*d)^2*n)/(a + b*x)^2) + (8*b^2*B*c*d*n)/(a + b*x) - (8*a*b*
B*d^2*n)/(a + b*x) + (2*b*B*d*(b*c - a*d)*n)/(a + b*x) - (4*b*B*c*d^2*n)/(c
 + d*x) + (4*a*B*d^3*n)/(c + d*x) + 6*b*B*d^2*n*Log[a + b*x] - (2*b*(b*c -
a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (8*b*d*(b*c -
a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + (4*d^2*(b*c - a*d)
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 12*b*d^2*Log[a + b*x]*
```

```
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*b*B*d^2*n*Log[c + d*x] - 12*b*d^
2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 6*b*B*d^2*n*(Log[a
+ b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)]) + 6*b*B*d^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
))/(4*(b*c - a*d)^4*g^3*i^2)
```

Maple [F] time = 0.746, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 1.75279, size = 2327, normalized size = 6.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*
b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^
3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 -
2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d
^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*
a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*
b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2
*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3
 + a^4*d^4)*g^3*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/4*(b^3*c^3
 - 12*a*b^2*c^2*d + 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*
x^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b
^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b
^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2
 - 3*(3*b^3*c^2*d - 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c
*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b
*x + a) + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2
*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2
*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c)
)*B*n/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 + 6*a^4*b^2*c^3*d^2*g^
3*i^2 - 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (b^6*c^4*d*g^3*i^2 -
4*a*b^5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4*a^3*b^3*c*d^4*g^3*i
^2 + a^4*b^2*d^5*g^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*b^5*c^4*d*g^3*i^2 -
2*a^2*b^4*c^3*d^2*g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 - 7*a^4*b^2*c*d^4*g^3
*i^2 + 2*a^5*b*d^5*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2 - 7*a^2*b^4*c^4*d*g^
3*i^2 + 8*a^3*b^3*c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g^3*i^2 - 2*a^5*b*c*d
^4*g^3*i^2 + a^6*d^5*g^3*i^2)*x) + 1/2*A*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*
c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2
```

```
+ 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a
^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4
- 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x +
(a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*
b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*
c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d
+ 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2))
```

Fricas [B] time = 0.588953, size = 1956, normalized size = 5.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] -1/4*(2*A*b^3*c^3 - 12*A*a*b^2*c^2*d + 6*A*a^2*b*c*d^2 + 4*A*a^3*d^3 - 6*(2
*A*b^3*c*d^2 - 2*A*a*b^2*d^3 + (B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2 - 6*(B*b^
3*d^3*n*x^3 + B*a^2*b*c*d^2*n + (B*b^3*c*d^2 + 2*B*a*b^2*d^3)*n*x^2 + (2*B*
a*b^2*c*d^2 + B*a^2*b*d^3)*n*x)*log((b*x + a)/(d*x + c))^2 + (B*b^3*c^3 - 1
2*B*a*b^2*c^2*d + 15*B*a^2*b*c*d^2 - 4*B*a^3*d^3)*n - 3*(2*A*b^3*c^2*d + 4*
A*a*b^2*c*d^2 - 6*A*a^2*b*d^3 + (3*B*b^3*c^2*d - 2*B*a*b^2*c*d^2 - B*a^2*b*
d^3)*n)*x + 2*(B*b^3*c^3 - 6*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2 + 2*B*a^3*d^3
- 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*d + 2*B*a*b^2*c*d^2 - 3*
B*a^2*b*d^3)*x - 6*(B*b^3*d^3*x^3 + B*a^2*b*c*d^2 + (B*b^3*c*d^2 + 2*B*a*b^
2*d^3)*x^2 + (2*B*a*b^2*c*d^2 + B*a^2*b*d^3)*x)*log((b*x + a)/(d*x + c)))*l
og(e) - 2*(6*A*a^2*b*c*d^2 + 3*(B*b^3*d^3*n + 2*A*b^3*d^3)*x^3 + 3*(3*B*b^3
*c*d^2*n + 2*A*b^3*c*d^2 + 4*A*a*b^2*d^3)*x^2 - (B*b^3*c^3 - 6*B*a*b^2*c^2*
d + 2*B*a^3*d^3)*n + 3*(4*A*a*b^2*c*d^2 + 2*A*a^2*b*d^3 + (B*b^3*c^2*d + 4*
B*a*b^2*c*d^2 - 2*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^6*c^4*d
- 4*a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a^4*b^2*d^5)*g^3*
i^2*x^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^3*b^3*c^2*d^3
- 7*a^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*i^2*x^2 + (2*a*b^5*c^5 - 7*a^2*b^4*c^4
*d + 8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*d^5)*g^3*i
^2*x + (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c^2*d^3
 + a^6*c*d^4)*g^3*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{(bgx+ag)^3(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^3*(d*i*x +
c*i)^2), x)
```

3.150 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=477

$$-\frac{6b^2d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{b^4(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4i^2(a+bx)^3(bc-ad)^5}+\frac{2b^3d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)^2(bc-ad)^5}$$

```
[Out] -((B*d^4*n*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x))) - (6*b^2*B*d^2*n*(
c + d*x))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B*d*n*(c + d*x)^2)/((b*c
 - a*d)^5*g^4*i^2*(a + b*x)^2) - (b^4*B*n*(c + d*x)^3)/(9*(b*c - a*d)^5*g^4
*i^2*(a + b*x)^3) + (d^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (6*b^2*d^2*(c + d*x)*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*d*(c + d*x
)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x
)^2) - (b^4*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a
*d)^5*g^4*i^2*(a + b*x)^3) - (4*b*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^5*g^4*i^2) + (2*b*B*d^3*n*Log[(a +
 b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2)
```

Rubi [C] time = 1.35697, antiderivative size = 735, normalized size of antiderivative = 1.54, number of steps used = 34, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{4bBd^3n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^4i^2(bc-ad)^5}-\frac{4bBd^3n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^4i^2(bc-ad)^5}-\frac{4bd^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(bc-ad)^5}-\frac{d^3\left(B\log\right.}{g^4i^2(c}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*i*x)^2
),x]
```

```
[Out] -(b*B*n)/(9*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (2*b*B*d*n)/(3*(b*c - a*d)
^3*g^4*i^2*(a + b*x)^2) - (13*b*B*d^2*n)/(3*(b*c - a*d)^4*g^4*i^2*(a + b*x)
) + (B*d^3*n)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (10*b*B*d^3*n*Log[a + b*x
])/(3*(b*c - a*d)^5*g^4*i^2) + (2*b*B*d^3*n*Log[a + b*x]^2)/((b*c - a*d)^5*
g^4*i^2) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^2*g^4*
i^2*(a + b*x)^3) + (b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d
)^3*g^4*i^2*(a + b*x)^2) - (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
/((b*c - a*d)^4*g^4*i^2*(a + b*x)) - (d^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]))/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (4*b*d^3*Log[a + b*x]*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2) + (10*b*B*d^3*n*Log[c
 + d*x])/(3*(b*c - a*d)^5*g^4*i^2) - (4*b*B*d^3*n*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) + (4*b*d^3*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) + (2*b*B*d^3*n*
Log[c + d*x]^2)/((b*c - a*d)^5*g^4*i^2) - (4*b*B*d^3*n*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) - (4*b*B*d^3*n*PolyLog[2,
-((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (4*b*B*d^3*n*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
```

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(150c+150dx)^2(ag+bgx)^4}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^2g^4(a+bx)^4} - \frac{b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11250(bc-ad)^3g^4(a+bx)^3} + \frac{b^2d^2\left(A+B\log\right.}{7500(bc-ad)}\right.$$

$$= -\frac{\left(b^2d^3\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{5625(bc-ad)^5g^4} + \frac{\left(bd^4\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{5625(bc-ad)^5g^4} + \frac{\left(b^2d^2\right)\int \frac{A+B\log\left(e\right.}{(a+bx}}{7500(bc-ad}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+B\log\left(e\right.\right.}{7500(bc-ad)^4g}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+B\log\left(e\right.\right.}{7500(bc-ad)^4g}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc-ad)^2g^4(a+bx)^3} + \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc-ad)^3g^4(a+bx)^2} - \frac{bd^2\left(A+B\log\left(e\right.\right.}{7500(bc-ad)^4g}$$

$$= -\frac{bBn}{202500(bc-ad)^2g^4(a+bx)^3} + \frac{bBdn}{33750(bc-ad)^3g^4(a+bx)^2} - \frac{13bBd^2}{67500(bc-ad)^4}$$

$$= -\frac{bBn}{202500(bc-ad)^2g^4(a+bx)^3} + \frac{bBdn}{33750(bc-ad)^3g^4(a+bx)^2} - \frac{13bBd^2}{67500(bc-ad)^4}$$

$$= -\frac{bBn}{202500(bc-ad)^2g^4(a+bx)^3} + \frac{bBdn}{33750(bc-ad)^3g^4(a+bx)^2} - \frac{13bBd^2}{67500(bc-ad)^4}$$

Mathematica [C] time = 1.5508, size = 549, normalized size = 1.15

$$-\frac{-18bBd^3n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18bBd^3n\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*
i*x)^2),x]
```

```
[Out] -((b*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (6*b*B*d*(b*c - a*d)^2*n)/(a + b*x)^2
 + (27*b^2*B*c*d^2*n)/(a + b*x) - (27*a*b*B*d^3*n)/(a + b*x) + (12*b*B*d^2*
(b*c - a*d)*n)/(a + b*x) - (9*b*B*c*d^3*n)/(c + d*x) + (9*a*B*d^4*n)/(c + d
```

```
*x) + 30*b*B*d^3*n*Log[a + b*x] + (3*b*(b*c - a*d)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(a + b*x)^3 - (9*b*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(a + b*x)^2 + (27*b*d^2*(b*c - a*d)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(a + b*x) - (9*d^3*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(c + d*x) + 36*b*d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]) - 30*b*B*d^3*n*Log[c + d*x] - 36*b*d^3*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[c + d*x] - 18*b*B*d^3*n*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) + 18*b*B*d^3*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])
*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(9*(b*c - a*d)^5*
g^4*i^2)
```

Maple [F] time = 0.769, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}\left(dix+ci\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 2.23904, size = 3460, normalized size = 7.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -1/3*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*
d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a
^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*
c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d
^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3
*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a
^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d +
 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x
+ (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^
7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^
2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12
*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3
*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(e*(b*x/(d*x + c) + a/
(d*x + c))^n) - 1/9*(b^4*c^4 - 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*
b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 +
8*a*b^3*c*d^3 - 19*a^2*b^2*d^4)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*
c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c
*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*
c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c
*d^3 + a^3*b*d^4)*x)*log(d*x + c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + 57*
a^2*b^2*c*d^3 + 19*a^3*b*d^4)*x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^
3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3
```

```
 + a^3*b*d^4)*x)*log(b*x + a) - 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c
*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2
*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3
*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^
4)*x)*log(b*x + a))*log(d*x + c))*B*n/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*
d*g^4*i^2 + 10*a^5*b^3*c^4*d^2*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7
*b*c^2*d^4*g^4*i^2 - a^8*c*d^5*g^4*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d
^2*g^4*i^2 + 10*a^2*b^6*c^3*d^3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^
4*b^4*c*d^5*g^4*i^2 - a^5*b^3*d^6*g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7
*c^5*d*g^4*i^2 - 5*a^2*b^6*c^4*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 2
5*a^4*b^4*c^2*d^4*g^4*i^2 + 14*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^
2)*x^3 + 3*(a*b^7*c^6*g^4*i^2 - 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2
*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*
g^4*i^2)*x^2 + (3*a^2*b^6*c^6*g^4*i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b
^4*c^4*d^2*g^4*i^2 - 20*a^5*b^3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2
 + 2*a^7*b*c*d^5*g^4*i^2 - a^8*d^6*g^4*i^2)*x) - 1/3*A*((12*b^3*d^3*x^3 + b
^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^
2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d -
4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^
2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 1
1*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4
*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g
^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5
*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*
c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^
3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*
c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12*b*d^3*log(d*x + c)/((b^5*c
^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^
4 - a^5*d^5)*g^4*i^2))
```

Fricas [B] time = 0.681035, size = 3012, normalized size = 6.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] -1/9*(3*A*b^4*c^4 - 18*A*a*b^3*c^3*d + 54*A*a^2*b^2*c^2*d^2 - 30*A*a^3*b*c*
d^3 - 9*A*a^4*d^4 + 6*(6*A*b^4*c*d^3 - 6*A*a*b^3*d^4 + 5*(B*b^4*c*d^3 - B*a
*b^3*d^4)*n)*x^3 + 3*(6*A*b^4*c^2*d^2 + 24*A*a*b^3*c*d^3 - 30*A*a^2*b^2*d^4
 + (11*B*b^4*c^2*d^2 + 8*B*a*b^3*c*d^3 - 19*B*a^2*b^2*d^4)*n)*x^2 + 18*(B*b
^4*d^4*n*x^4 + B*a^3*b*c*d^3*n + (B*b^4*c*d^3 + 3*B*a*b^3*d^4)*n*x^3 + 3*(B
*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n*x^2 + (3*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*n*x
)*log((b*x + a)/(d*x + c))^2 + (B*b^4*c^4 - 9*B*a*b^3*c^3*d + 54*B*a^2*b^2*
c^2*d^2 - 55*B*a^3*b*c*d^3 + 9*B*a^4*d^4)*n - (6*A*b^4*c^3*d - 54*A*a*b^3*c
^2*d^2 - 18*A*a^2*b^2*c*d^3 + 66*A*a^3*b*d^4 + (5*B*b^4*c^3*d - 81*B*a*b^3*
c^2*d^2 + 57*B*a^2*b^2*c*d^3 + 19*B*a^3*b*d^4)*n)*x + 3*(B*b^4*c^4 - 6*B*a*
b^3*c^3*d + 18*B*a^2*b^2*c^2*d^2 - 10*B*a^3*b*c*d^3 - 3*B*a^4*d^4 + 12*(B*b
^4*c*d^3 - B*a*b^3*d^4)*x^3 + 6*(B*b^4*c^2*d^2 + 4*B*a*b^3*c*d^3 - 5*B*a^2*
b^2*d^4)*x^2 - 2*(B*b^4*c^3*d - 9*B*a*b^3*c^2*d^2 - 3*B*a^2*b^2*c*d^3 + 11*
B*a^3*b*d^4)*x + 12*(B*b^4*d^4*x^4 + B*a^3*b*c*d^3 + (B*b^4*c*d^3 + 3*B*a*b
^3*d^4)*x^3 + 3*(B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*x^2 + (3*B*a^2*b^2*c*d^3 +
B*a^3*b*d^4)*x)*log((b*x + a)/(d*x + c)))*log(e) + 3*(12*A*a^3*b*c*d^3 + 2*
(5*B*b^4*d^4*n + 6*A*b^4*d^4)*x^4 + 2*(6*A*b^4*c*d^3 + 18*A*a*b^3*d^4 + (11
*B*b^4*c*d^3 + 9*B*a*b^3*d^4)*n)*x^3 + 6*(6*A*a*b^3*c*d^3 + 6*A*a^2*b^2*d^4
```

```
 + (B*b^4*c^2*d^2 + 9*B*a*b^3*c*d^3)*n)*x^2 + (B*b^4*c^4 - 6*B*a*b^3*c^3*d
+ 18*B*a^2*b^2*c^2*d^2 - 3*B*a^4*d^4)*n + 2*(18*A*a^2*b^2*c*d^3 + 6*A*a^3*b
*d^4 - (B*b^4*c^3*d - 9*B*a*b^3*c^2*d^2 - 18*B*a^2*b^2*c*d^3 + 6*B*a^3*b*d^
4)*n)*x)*log((b*x + a)/(d*x + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b
^6*c^3*d^3 - 10*a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*i^2*x^
4 + (b^8*c^6 - 2*a*b^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*
a^4*b^4*c^2*d^4 + 14*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*g^4*i^2*x^3 + 3*(a*b^7*
c^6 - 4*a^2*b^6*c^5*d + 5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c
*d^5 - a^7*b*d^6)*g^4*i^2*x^2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*
b^4*c^4*d^2 - 20*a^5*b^3*c^3*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*
d^6)*g^4*i^2*x + (a^3*b^5*c^6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a
^6*b^2*c^3*d^3 + 5*a^7*b*c^2*d^4 - a^8*c*d^5)*g^4*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(bgx+ag\right)^{4}(dix+ci)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^4*(d*i*x +
c*i)^2), x)
```

3.151 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=382

$$\frac{3b^2Bg^3n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}+\frac{b^2g^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{d^4i^3}+\frac{g^3(a+bx)^2(bc}{}$$

```
[Out] (-3*B*(b*c - a*d)*g^3*n*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (3*b*B*(b*c
- a*d)*g^3*n*(a + b*x))/(d^3*i^3*(c + d*x)) + (b*(b*c - a*d)*g^3*(3*A + B*n
)*(a + b*x))/(d^3*i^3*(c + d*x)) + (3*b*B*(b*c - a*d)*g^3*(a + b*x)*Log[e*(
(a + b*x)/(c + d*x))^n])/(d^3*i^3*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(d*i^3*(c + d*x)^2) + ((b*c - a*d)*g^3*(a + b*
x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^3*(c + d*x)
^2) + (b^2*(b*c - a*d)*g^3*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*n*Pol
yLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)
```

Rubi [A] time = 0.7455, antiderivative size = 461, normalized size of antiderivative = 1.21, number of steps used = 21, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{3b^2Bg^3n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^4i^3}-\frac{3b^2g^3(bc-ad)\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i^3}-\frac{3bg^3(bc-ad)^2\left(B\log\left(\right.\right.}{d^4i^3(c+}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
3,x]
```

```
[Out] (A*b^3*g^3*x)/(d^3*i^3) - (B*(b*c - a*d)^3*g^3*n)/(4*d^4*i^3*(c + d*x)^2) +
 (5*b*B*(b*c - a*d)^2*g^3*n)/(2*d^4*i^3*(c + d*x)) + (5*b^2*B*(b*c - a*d)*g
^3*n*Log[a + b*x])/(2*d^4*i^3) + (b^2*B*g^3*(a + b*x)*Log[e*((a + b*x)/(c +
 d*x))^n])/(d^3*i^3) + ((b*c - a*d)^3*g^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]))/(2*d^4*i^3*(c + d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/(d^4*i^3*(c + d*x)) - (7*b^2*B*(b*c - a*d)*g^3*n*Log[c
 + d*x])/(2*d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*n*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/(d^4*i^3) - (3*b^2*(b*c - a*d)*g^3*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[c + d*x])/(d^4*i^3) - (3*b^2*B*(b*c - a*d)*g^3*n*
Log[c + d*x]^2)/(2*d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*n*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])/(d^4*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
```

```
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(151c+151dx)^3}\,dx = \int\left(\frac{b^3g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3442951d^3}+\frac{(-bc+ad)^3g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{3442951d^3(c+dx)^3}\right.$$

$$=\frac{\left(b^3g^3\right)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx}{3442951d^3}-\frac{\left(3b^2(bc-ad)g^3\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.}{c+dx}}{3442951d^3}$$

$$=\frac{Ab^3g^3x}{3442951d^3}+\frac{(bc-ad)^3g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6885902d^4(c+dx)^2}-\frac{3b(bc-ad)^2g^3\left(A\right.}{3442951}$$

$$=\frac{Ab^3g^3x}{3442951d^3}+\frac{b^2Bg^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3442951d^3}+\frac{(bc-ad)^3g^3\left(A+B\log\right.}{6885902d^4(c+d}$$

$$=\frac{Ab^3g^3x}{3442951d^3}+\frac{b^2Bg^3(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3442951d^3}+\frac{(bc-ad)^3g^3\left(A+B\log\right.}{6885902d^4(c+d}$$

$$=\frac{Ab^3g^3x}{3442951d^3}-\frac{B(bc-ad)^3g^3n}{13771804d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3n}{6885902d^4(c+dx)}+\frac{5b^2B(bc-a}{68}$$

$$=\frac{Ab^3g^3x}{3442951d^3}-\frac{B(bc-ad)^3g^3n}{13771804d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3n}{6885902d^4(c+dx)}+\frac{5b^2B(bc-a}{68}$$

$$=\frac{Ab^3g^3x}{3442951d^3}-\frac{B(bc-ad)^3g^3n}{13771804d^4(c+dx)^2}+\frac{5bB(bc-ad)^2g^3n}{6885902d^4(c+dx)}+\frac{5b^2B(bc-a}{68}$$

Mathematica [A] time = 0.484582, size = 334, normalized size = 0.87

$$g^3\left(6b^2Bn(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-12b^2(bc-ad)\log(c+dx)\left(\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x)^3,x]
```

```
[Out] (g^3*(4*A*b^3*d*x - (B*(b*c - a*d)^3*n)/(c + d*x)^2 + (10*b*B*(b*c - a*d)^2
*n)/(c + d*x) + 10*b^2*B*(b*c - a*d)*n*Log[a + b*x] + 4*b^2*B*d*(a + b*x)*L
og[e*((a + b*x)/(c + d*x))^n] + (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(c + d*x)^2 - (12*b*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(c + d*x) - 14*b^2*B*(b*c - a*d)*n*Log[c + d*x] - 12*b^2*(b*c
- a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 6*b^2*B*(b*c -
 a*d)*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*d^4*i^3)
```

Maple [F] time = 0.605, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{3}}{\left(dix+ci\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 3.13512, size = 3907, normalized size = 10.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 3/4*B*a^2*b*g^3*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*
d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)
 + 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*
i^3) - 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d
^4)*i^3)) + 1/4*B*a^3*g^3*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3
*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*l
og(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/
((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*A*b^3*g^3*((6*c^2*d*x + 5*
c^3)/(d^6*i^3*x^2 + 2*c*d^5*i^3*x + c^2*d^4*i^3) - 2*x/(d^3*i^3) + 6*c*log(
d*x + c)/(d^4*i^3)) + 3/2*A*a*b^2*g^3*((4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c
*d^4*i^3*x + c^2*d^3*i^3) + 2*log(d*x + c)/(d^3*i^3)) - 3/2*(2*d*x + c)*B*a
^2*b*g^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4*i^3*x^2 + 2*c*d^3*i^3*
x + c^2*d^2*i^3) - 3/2*(2*d*x + c)*A*a^2*b*g^3/(d^4*i^3*x^2 + 2*c*d^3*i^3*x
 + c^2*d^2*i^3) - 1/2*B*a^3*g^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^3
*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A*a^3*g^3/(d^3*i^3*x^2 + 2*c*d^
2*i^3*x + c^2*d*i^3) + 1/2*(6*a^3*b^2*d^3*g^3*log(e) - (7*g^3*n + 6*g^3*log
(e))*b^5*c^3 + (19*g^3*n + 18*g^3*log(e))*a*b^4*c^2*d - 2*(7*g^3*n + 9*g^3*
log(e))*a^2*b^3*c*d^2)*B*log(d*x + c)/(b^2*c^2*d^4*i^3 - 2*a*b*c*d^5*i^3 +
a^2*d^6*i^3) + 1/4*(4*(b^5*c^2*d^3*g^3*log(e) - 2*a*b^4*c*d^4*g^3*log(e) +
a^2*b^3*d^5*g^3*log(e))*B*x^3 + 8*(b^5*c^3*d^2*g^3*log(e) - 2*a*b^4*c^2*d^3
*g^3*log(e) + a^2*b^3*c*d^4*g^3*log(e))*B*x^2 + 2*((5*g^3*n - 4*g^3*log(e))
*b^5*c^4*d - 20*(g^3*n - g^3*log(e))*a*b^4*c^3*d^2 + (27*g^3*n - 28*g^3*log
(e))*a^2*b^3*c^2*d^3 - 12*(g^3*n - g^3*log(e))*a^3*b^2*c*d^4)*B*x + 12*((b^
5*c^3*d^2*g^3*n - 3*a*b^4*c^2*d^3*g^3*n + 3*a^2*b^3*c*d^4*g^3*n - a^3*b^2*d
^5*g^3*n)*B*x^2 + 2*(b^5*c^4*d*g^3*n - 3*a*b^4*c^3*d^2*g^3*n + 3*a^2*b^3*c^
```

```
2*d^3*g^3*n - a^3*b^2*c*d^4*g^3*n)*B*x + (b^5*c^5*g^3*n - 3*a*b^4*c^4*d*g^3
*n + 3*a^2*b^3*c^3*d^2*g^3*n - a^3*b^2*c^2*d^3*g^3*n)*B)*log(b*x + a)*log(d
*x + c) - 6*((b^5*c^3*d^2*g^3*n - 3*a*b^4*c^2*d^3*g^3*n + 3*a^2*b^3*c*d^4*g
^3*n - a^3*b^2*d^5*g^3*n)*B*x^2 + 2*(b^5*c^4*d*g^3*n - 3*a*b^4*c^3*d^2*g^3*
n + 3*a^2*b^3*c^2*d^3*g^3*n - a^3*b^2*c*d^4*g^3*n)*B*x + (b^5*c^5*g^3*n - 3
*a*b^4*c^4*d*g^3*n + 3*a^2*b^3*c^3*d^2*g^3*n - a^3*b^2*c^2*d^3*g^3*n)*B)*lo
g(d*x + c)^2 + ((9*g^3*n - 10*g^3*log(e))*b^5*c^5 - (35*g^3*n - 38*g^3*log(
e))*a*b^4*c^4*d + (47*g^3*n - 46*g^3*log(e))*a^2*b^3*c^3*d^2 - 3*(7*g^3*n -
 6*g^3*log(e))*a^3*b^2*c^2*d^3)*B + 2*((5*b^5*c^3*d^2*g^3*n - 13*a*b^4*c^2*
d^3*g^3*n + 8*a^2*b^3*c*d^4*g^3*n + 2*a^3*b^2*d^5*g^3*n)*B*x^2 + 2*(5*b^5*c
^4*d*g^3*n - 13*a*b^4*c^3*d^2*g^3*n + 8*a^2*b^3*c^2*d^3*g^3*n + 2*a^3*b^2*c
*d^4*g^3*n)*B*x + (5*b^5*c^5*g^3*n - 13*a*b^4*c^4*d*g^3*n + 8*a^2*b^3*c^3*d
^2*g^3*n + 2*a^3*b^2*c^2*d^3*g^3*n)*B)*log(b*x + a) + 2*(2*(b^5*c^2*d^3*g^3
 - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3)*B*x^3 + 4*(b^5*c^3*d^2*g^3 - 2*a*b^
4*c^2*d^3*g^3 + a^2*b^3*c*d^4*g^3)*B*x^2 - 4*(b^5*c^4*d*g^3 - 5*a*b^4*c^3*d
^2*g^3 + 7*a^2*b^3*c^2*d^3*g^3 - 3*a^3*b^2*c*d^4*g^3)*B*x - (5*b^5*c^5*g^3
- 19*a*b^4*c^4*d*g^3 + 23*a^2*b^3*c^3*d^2*g^3 - 9*a^3*b^2*c^2*d^3*g^3)*B -
6*((b^5*c^3*d^2*g^3 - 3*a*b^4*c^2*d^3*g^3 + 3*a^2*b^3*c*d^4*g^3 - a^3*b^2*d
^5*g^3)*B*x^2 + 2*(b^5*c^4*d*g^3 - 3*a*b^4*c^3*d^2*g^3 + 3*a^2*b^3*c^2*d^3*
g^3 - a^3*b^2*c*d^4*g^3)*B*x + (b^5*c^5*g^3 - 3*a*b^4*c^4*d*g^3 + 3*a^2*b^3
*c^3*d^2*g^3 - a^3*b^2*c^2*d^3*g^3)*B)*log(d*x + c))*log((b*x + a)^n) - 2*(
2*(b^5*c^2*d^3*g^3 - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3)*B*x^3 + 4*(b^5*c^
3*d^2*g^3 - 2*a*b^4*c^2*d^3*g^3 + a^2*b^3*c*d^4*g^3)*B*x^2 - 4*(b^5*c^4*d*g
^3 - 5*a*b^4*c^3*d^2*g^3 + 7*a^2*b^3*c^2*d^3*g^3 - 3*a^3*b^2*c*d^4*g^3)*B*x
 - (5*b^5*c^5*g^3 - 19*a*b^4*c^4*d*g^3 + 23*a^2*b^3*c^3*d^2*g^3 - 9*a^3*b^2
*c^2*d^3*g^3)*B - 6*((b^5*c^3*d^2*g^3 - 3*a*b^4*c^2*d^3*g^3 + 3*a^2*b^3*c*d
^4*g^3 - a^3*b^2*d^5*g^3)*B*x^2 + 2*(b^5*c^4*d*g^3 - 3*a*b^4*c^3*d^2*g^3 +
3*a^2*b^3*c^2*d^3*g^3 - a^3*b^2*c*d^4*g^3)*B*x + (b^5*c^5*g^3 - 3*a*b^4*c^4
*d*g^3 + 3*a^2*b^3*c^3*d^2*g^3 - a^3*b^2*c^2*d^3*g^3)*B)*log(d*x + c))*log(
(d*x + c)^n))/(b^2*c^4*d^4*i^3 - 2*a*b*c^3*d^5*i^3 + a^2*c^2*d^6*i^3 + (b^2
*c^2*d^6*i^3 - 2*a*b*c*d^7*i^3 + a^2*d^8*i^3)*x^2 + 2*(b^2*c^3*d^5*i^3 - 2*
a*b*c^2*d^6*i^3 + a^2*c*d^7*i^3)*x) - 3*(b^3*c*g^3*n - a*b^2*d*g^3*n)*(log(
b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a
*d)))*B/(d^4*i^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^3g^3x^3 + 3\,Aab^2g^3x^2 + 3\,Aa^2bg^3x + Aa^3g^3 + \left(Bb^3g^3x^3 + 3\,Bab^2g^3x^2 + 3\,Ba^2bg^3x + Ba^3g^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x + c^3i^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] integral((A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3 +
 (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log(e*((
b*x + a)/(d*x + c))^n))/(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^
3*i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^3 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c
*i)^3, x)
```

3.152 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=263

$$-\frac{b^2Bg^2n\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^3}-\frac{g^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2di^3(c+dx)^2}-\frac{A}{d}$$

```
[Out] (B*g^2*n*(a + b*x)^2)/(4*d*i^3*(c + d*x)^2) - (A*b*g^2*(a + b*x))/(d^2*i^3*
(c + d*x)) + (b*B*g^2*n*(a + b*x))/(d^2*i^3*(c + d*x)) - (b*B*g^2*(a + b*x)
*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^3*(c + d*x)) - (g^2*(a + b*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i^3*(c + d*x)^2) - (b^2*g^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^3)
 - (b^2*B*g^2*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rubi [A] time = 0.597234, antiderivative size = 356, normalized size of antiderivative = 1.35, number of steps used = 18, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{b^2Bg^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^3i^3}+\frac{b^2g^2\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^3}+\frac{2bg^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^3(c+dx)}-$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^
3,x]
```

```
[Out] (B*(b*c - a*d)^2*g^2*n)/(4*d^3*i^3*(c + d*x)^2) - (3*b*B*(b*c - a*d)*g^2*n)
/(2*d^3*i^3*(c + d*x)) - (3*b^2*B*g^2*n*Log[a + b*x])/(2*d^3*i^3) - ((b*c -
 a*d)^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^3*i^3*(c + d*x)^2)
 + (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^3*(c
 + d*x)) + (3*b^2*B*g^2*n*Log[c + d*x])/(2*d^3*i^3) - (b^2*B*g^2*n*Log[-((d
*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3*i^3) + (b^2*g^2*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^3*i^3) + (b^2*B*g^2*n*Log[c + d*x
]^2)/(2*d^3*i^3) - (b^2*B*g^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3
*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(152c+152dx)^3}\,dx = \int \left(\frac{(-bc+ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3511808d^2(c+dx)^3} - \frac{b(bc-ad)g^2\left(A+B\log\left(e\right.\right.}{1755904d^2(c+dx)}\right.$$

$$= \frac{\left(b^2g^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{3511808d^2} - \frac{\left(b(bc-ad)g^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}dx}{1755904d^2} + \frac{((b}{}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7023616d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{1755904d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7023616d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{1755904d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7023616d^3(c+dx)^2} + \frac{b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{1755904d^3(c+dx)}$$

$$= \frac{B(bc-ad)^2g^2n}{14047232d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n}{7023616d^3(c+dx)} - \frac{3b^2Bg^2n\log(a+bx)}{7023616d^3} - \frac{(bc}{}$$

$$= \frac{B(bc-ad)^2g^2n}{14047232d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n}{7023616d^3(c+dx)} - \frac{3b^2Bg^2n\log(a+bx)}{7023616d^3} - \frac{(bc}{}$$

$$= \frac{B(bc-ad)^2g^2n}{14047232d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n}{7023616d^3(c+dx)} - \frac{3b^2Bg^2n\log(a+bx)}{7023616d^3} - \frac{(bc}{}$$

Mathematica [A] time = 0.355202, size = 259, normalized size = 0.98

$$\frac{g^2\left(-2b^2Bn\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+4b^2\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d
*i*x)^3,x]
```

```
[Out] (g^2*((B*(b*c - a*d)^2*n)/(c + d*x)^2 - (6*b*B*(b*c - a*d)*n)/(c + d*x) - 6
*b^2*B*n*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(c + d*x)^2 + (8*b*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(c + d*x) + 6*b^2*B*n*Log[c + d*x] + 4*b^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])*Log[c + d*x] - 2*b^2*B*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - L
og[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*d
^3*i^3)
```

Maple [F] time = 0.68, size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2}{(dix+ci)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B*a*b*g^2*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^
5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) +
 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^
3) - 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4
)*i^3)) + 1/4*B*a^2*g^2*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x
^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log
(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((
b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 1/2*A*b^2*g^2*((4*c*d*x + 3*c^2)
/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2*log(d*x + c)/(d^3*i^3)) -
1/2*B*b^2*g^2*((2*(d^2*n*x^2 + 2*c*d*n*x + c^2*n)*log(b*x + a)*log(d*x + c)
 - (d^2*n*x^2 + 2*c*d*n*x + c^2*n)*log(d*x + c)^2 - (4*c*d*x + 3*c^2 + 2*(d
^2*x^2 + 2*c*d*x + c^2)*log(d*x + c))*log((b*x + a)^n) + (4*c*d*x + 3*c^2 +
 2*(d^2*x^2 + 2*c*d*x + c^2)*log(d*x + c))*log((d*x + c)^n))/(d^5*i^3*x^2 +
 2*c*d^4*i^3*x + c^2*d^3*i^3) - 2*integrate(1/2*(2*b*d^3*x^3*log(e) + 2*a*d
^3*x^2*log(e) - 3*b*c^3*n + 3*a*c^2*d*n - 4*(b*c^2*d*n - a*c*d^2*n)*x + 2*(
b*d^3*n*x^3 + a*c^2*d*n + (2*b*c*d^2*n + a*d^3*n)*x^2 + (b*c^2*d*n + 2*a*c*
d^2*n)*x)*log(b*x + a))/(b*d^6*i^3*x^4 + a*c^3*d^3*i^3 + (3*b*c*d^5*i^3 + a
*d^6*i^3)*x^3 + 3*(b*c^2*d^4*i^3 + a*c*d^5*i^3)*x^2 + (b*c^3*d^3*i^3 + 3*a*
c^2*d^4*i^3)*x), x)) - (2*d*x + c)*B*a*b*g^2*log(e*(b*x/(d*x + c) + a/(d*x
+ c))^n)/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (2*d*x + c)*A*a*b*g^
2/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*B*a^2*g^2*log(e*(b*x/(d
*x + c) + a/(d*x + c))^n)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A
*a^2*g^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Ab^2g^2x^2 + 2\,Aabg^2x + Aa^2g^2 + \left(Bb^2g^2x^2 + 2\,Babg^2x + Ba^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x + c^3i^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*
a*b*g^2*x + B*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^n))/(d^3*i^3*x^3 + 3*c*d
^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c
*i)^3, x)
```

3.153 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=89

$$\frac{g(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}-\frac{Bgn(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

```
[Out] -(B*g*n*(a + b*x)^2)/(4*(b*c - a*d)*i^3*(c + d*x)^2) + (g*(a + b*x)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*i^3*(c + d*x)^2)
```

Rubi [B] time = 0.316962, antiderivative size = 201, normalized size of antiderivative = 2.26, number of steps used = 10, number of rules used = 4, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.098, Rules used = {2528, 2525, 12, 44}

$$-\frac{bg\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^3(c+dx)}+\frac{g(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^2i^3(c+dx)^2}+\frac{b^2Bgn\log(a+bx)}{2d^2i^3(bc-ad)}-\frac{b^2Bgn\log(c+dx)}{2d^2i^3(bc-ad)}-\frac{Bgn(bc-}{4d^2i^3(c+}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^3,
x]
```

```
[Out] -(B*(b*c - a*d)*g*n)/(4*d^2*i^3*(c + d*x)^2) + (b*B*g*n)/(2*d^2*i^3*(c + d*
x)) + (b^2*B*g*n*Log[a + b*x])/(2*d^2*(b*c - a*d)*i^3) + ((b*c - a*d)*g*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^3*(c + d*x)^2) - (b*g*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^3*(c + d*x)) - (b^2*B*g*n*Log[c + d
*x])/(2*d^2*(b*c - a*d)*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(153c+153dx)^3}dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d(c+dx)^3}+\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d(c+dx)^2}\right) d$$

$$=\frac{(bg)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}dx}{3581577d}-\frac{((bc-ad)g)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^3}dx}{3581577d}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7163154d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d^2(c+dx)}+\frac{(bBgn}{}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7163154d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d^2(c+dx)}+\frac{(bB(bc}{}$$

$$=\frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7163154d^2(c+dx)^2}-\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3581577d^2(c+dx)}+\frac{(bB(bc}{}$$

$$=-\frac{B(bc-ad)gn}{14326308d^2(c+dx)^2}+\frac{bBgn}{7163154d^2(c+dx)}+\frac{b^2Bgn\log(a+bx)}{7163154d^2(bc-ad)}+\frac{(bc}{}$$

Mathematica [B] time = 0.156385, size = 215, normalized size = 2.42

$$\frac{g\left(-\frac{b\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2(c+dx)}+\frac{(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^2(c+dx)^2}-\frac{Bn\left(\frac{2b^2\log(a+bx)}{bc-ad}-\frac{2b^2\log(c+dx)}{bc-ad}+\frac{bc-ad}{(c+dx)^2}+\frac{2b}{c+dx}\right)}{4d^2}+\frac{bBn\left(\frac{b\log(a+bx)}{bc-ad}-\frac{b\log(c+dx)}{bc-ad}+\frac{1}{c+dx}\right)}{d^2}\right)}{i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i
*x)^3,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*(c + d*x)^2
) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*(c + d*x)) + (b*B*n*((c
 + d*x)^(-1) + (b*Log[a + b*x])/(b*c - a*d) - (b*Log[c + d*x])/(b*c - a*d))
)/d^2 - (B*n*((b*c - a*d)/(c + d*x)^2 + (2*b)/(c + d*x) + (2*b^2*Log[a + b*
x])/(b*c - a*d) - (2*b^2*Log[c + d*x])/(b*c - a*d)))/(4*d^2)))/i^3
```

Maple [F] time = 0.521, size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{(dix+ci)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 1.25808, size = 780, normalized size = 8.76

$$\frac{1}{4}Bbgn\left(\frac{bc^2-3\,acd+2\left(bcd-2\,ad^2\right)x}{\left(bcd^4-ad^5\right)i^3x^2+2\left(bc^2d^3-acd^4\right)i^3x+\left(bc^3d^2-ac^2d^3\right)i^3}+\frac{2\left(b^2c-2\,abd\right)\log\left(bx+a\right)}{\left(b^2c^2d^2-2\,abcd^3+a^2d^4\right)i^3}-\frac{2\left(b^2c-2\,abd\right)\log\left(\right.}{\left(b^2c^2d^2-2\,abcd^3+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] 1/4*B*b*g*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i
^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2*(
b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) -
 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^
3)) + 1/4*B*a*g*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(
b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x + a
)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*
d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*(2*d*x + c)*B*b*g*log(e*(b*x/(d*x +
c) + a/(d*x + c))^n)/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*(2*d
*x + c)*A*b*g/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*B*a*g*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
 - 1/2*A*a*g/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
```

Fricas [B] time = 0.534184, size = 509, normalized size = 5.72

$$\frac{\left(Bb^2c^2-Ba^2d^2\right)gn-2\left(Ab^2c^2-Aa^2d^2\right)g+2\left(\left(Bb^2cd-Babd^2\right)gn-2\left(Ab^2cd-Aabd^2\right)g\right)x-2\left(2\left(Bb^2cd-Babd^2\right)gx+\right.}{4\left(\left(bcd^4-ad^5\right)i^3x^2+2\left(bc^2d^3-acd^4\right)i^3x+\left(bc^3d^2-\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] 1/4*((B*b^2*c^2 - B*a^2*d^2)*g*n - 2*(A*b^2*c^2 - A*a^2*d^2)*g + 2*((B*b^2*
c*d - B*a*b*d^2)*g*n - 2*(A*b^2*c*d - A*a*b*d^2)*g)*x - 2*(2*(B*b^2*c*d - B
*a*b*d^2)*g*x + (B*b^2*c^2 - B*a^2*d^2)*g)*log(e) + 2*(B*b^2*d^2*g*n*x^2 +
2*B*a*b*d^2*g*n*x + B*a^2*d^2*g*n)*log((b*x + a)/(d*x + c)))/((b*c*d^4 - a*
d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.25183, size = 298, normalized size = 3.35

$$-\frac{Bb^2gn\log(bx+a)}{2\left(bcd^2i-ad^3i\right)}+\frac{Bb^2gn\log(dx+c)}{2\left(bcd^2i-ad^3i\right)}-\frac{\left(2\,Bbdginx+Bbcgin+Badgin\right)\log\left(\frac{bx+a}{dx+c}\right)}{2\left(d^4x^2+2\,cd^3x+c^2d^2\right)}+\frac{2\,Bbdginx+Bbcgin+Bad}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] -1/2*B*b^2*g*n*log(b*x + a)/(b*c*d^2*i - a*d^3*i) + 1/2*B*b^2*g*n*log(d*x +
 c)/(b*c*d^2*i - a*d^3*i) - 1/2*(2*B*b*d*g*i*n*x + B*b*c*g*i*n + B*a*d*g*i*
n)*log((b*x + a)/(d*x + c))/(d^4*x^2 + 2*c*d^3*x + c^2*d^2) + 1/4*(2*B*b*d*
g*i*n*x + B*b*c*g*i*n + B*a*d*g*i*n - 4*A*b*d*g*i*x - 4*B*b*d*g*i*x - 2*A*b
*c*g*i - 2*B*b*c*g*i - 2*A*a*d*g*i - 2*B*a*d*g*i)/(d^4*x^2 + 2*c*d^3*x + c^
2*d^2)
```

3.154 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dix)^3}\,dx$

Optimal. Leaf size=151

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2di^3(c+dx)^2}+\frac{b^2Bn\log(a+bx)}{2di^3(bc-ad)^2}-\frac{b^2Bn\log(c+dx)}{2di^3(bc-ad)^2}+\frac{bBn}{2di^3(c+dx)(bc-ad)}+\frac{Bn}{4di^3(c+dx)^2}$$

```
[Out] (B*n)/(4*d*i^3*(c + d*x)^2) + (b*B*n)/(2*d*(b*c - a*d)*i^3*(c + d*x)) + (b^
2*B*n*Log[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])/(2*d*i^3*(c + d*x)^2) - (b^2*B*n*Log[c + d*x])/(2*d*(b*c - a*d)^2
*i^3)
```

Rubi [A] time = 0.104282, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2di^3(c+dx)^2}+\frac{b^2Bn\log(a+bx)}{2di^3(bc-ad)^2}-\frac{b^2Bn\log(c+dx)}{2di^3(bc-ad)^2}+\frac{bBn}{2di^3(c+dx)(bc-ad)}+\frac{Bn}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^3,x]
```

```
[Out] (B*n)/(4*d*i^3*(c + d*x)^2) + (b*B*n)/(2*d*(b*c - a*d)*i^3*(c + d*x)) + (b^
2*B*n*Log[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])/(2*d*i^3*(c + d*x)^2) - (b^2*B*n*Log[c + d*x])/(2*d*(b*c - a*d)^2
*i^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(154c+154dx)^3}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c+dx)^2} + \frac{(Bn)\int \frac{bc-ad}{23716(a+bx)(c+dx)^3}\,dx}{308d}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c+dx)^2} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)^3}\,dx}{7304528d}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c+dx)^2} + \frac{(B(bc-ad)n)\int \left(\frac{b^3}{(bc-ad)^3(a+bx)} - \frac{d}{(bc-ad)(c+dx)^3} - \frac{bd}{(bc-ad)^2(c+dx)^2}\right.}{7304528d}$$

$$= \frac{Bn}{14609056d(c+dx)^2} + \frac{bBn}{7304528d(bc-ad)(c+dx)} + \frac{b^2Bn\log(a+bx)}{7304528d(bc-ad)^2} - \frac{A+B\log}{7304528}$$

Mathematica [A] time = 0.132717, size = 115, normalized size = 0.76

$$\frac{\frac{Bn\left(2b^2(c+dx)^2\log(a+bx)+(bc-ad)(-ad+3bc+2bdx)-2b^2(c+dx)^2\log(c+dx)\right)}{(bc-ad)^2} - 2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*n*((b*c - a*d)*(3*b*c - a*d
 + 2*b*d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*
x]))/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

Maple [F] time = 0.538, size = 0, normalized size = 0.

$$\int \frac{1}{(dix+ci)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

Maxima [A] time = 1.20476, size = 350, normalized size = 2.32

$$\frac{1}{4}Bn\left(\frac{2\,bdx+3\,bc-ad}{\left(bcd^3-ad^4\right)i^3x^2+2\left(bc^2d^2-acd^3\right)i^3x+\left(bc^3d-ac^2d^2\right)i^3} + \frac{2\,b^2\log(bx+a)}{\left(b^2c^2d-2\,abcd^2+a^2d^3\right)i^3} - \frac{2\,b^2\log(dx+c)}{\left(b^2c^2d-2\,abcd^2+a^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/4*B*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2
- a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x + a)/((b^2*c^
2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*
c*d^2 + a^2*d^3)*i^3)) - 1/2*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^3*
i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A/(d^3*i^3*x^2 + 2*c*d^2*i^3*x +
 c^2*d*i^3)
```

Fricas [A] time = 0.524769, size = 562, normalized size = 3.72

$$-\frac{2\,Ab^2c^2 - 4\,Aabcd + 2\,Aa^2d^2 - 2\left(Bb^2cd - Babd^2\right)nx - \left(3\,Bb^2c^2 - 4\,Babcd + Ba^2d^2\right)n + 2\left(Bb^2c^2 - 2\,Babcd + Ba^2d^2\right)\text{lo}}{4\left(\left(b^2c^2d^3 - 2\,abcd^4 + a^2d^5\right)i^3x^2 + 2\left(b^2c^3d^2 - 2\,abc^2d^3 + a^2cd^4\right)i^3x + \left(b^2c^4d\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="fric
as")
```

```
[Out] -1/4*(2*A*b^2*c^2 - 4*A*a*b*c*d + 2*A*a^2*d^2 - 2*(B*b^2*c*d - B*a*b*d^2)*n
*x - (3*B*b^2*c^2 - 4*B*a*b*c*d + B*a^2*d^2)*n + 2*(B*b^2*c^2 - 2*B*a*b*c*d
 + B*a^2*d^2)*log(e) - 2*(B*b^2*d^2*n*x^2 + 2*B*b^2*c*d*n*x + (2*B*a*b*c*d
- B*a^2*d^2)*n)*log((b*x + a)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2
*d^5)*i^3*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*i^3*x + (b^2*c^
4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3)*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.30498, size = 309, normalized size = 2.05

$$-\frac{Bb^2n\log\left(bx+a\right)}{2\left(b^2c^2di - 2\,abcd^2i + a^2d^3i\right)} + \frac{Bb^2n\log\left(dx+c\right)}{2\left(b^2c^2di - 2\,abcd^2i + a^2d^3i\right)} - \frac{Bin\log\left(\frac{bx+a}{dx+c}\right)}{2\left(d^3x^2 + 2\,cd^2x + c^2d\right)} + \frac{2\,Bbdinx + 3\,Bbcin - Badin -}{4\left(bcd^3x^2 - ad^4x^2 + 2\,bc^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="giac
")
```

```
[Out] -1/2*B*b^2*n*log(b*x + a)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) + 1/2*B
*b^2*n*log(d*x + c)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) - 1/2*B*i*n*l
og((b*x + a)/(d*x + c))/(d^3*x^2 + 2*c*d^2*x + c^2*d) + 1/4*(2*B*b*d*i*n*x
+ 3*B*b*c*i*n - B*a*d*i*n - 2*A*b*c*i - 2*B*b*c*i + 2*A*a*d*i + 2*B*a*d*i)/
(b*c*d^3*x^2 - a*d^4*x^2 + 2*b*c^2*d^2*x - 2*a*c*d^3*x + b*c^3*d - a*c^2*d^
2)
```

3.155 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=254

$$\frac{b^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{gi^3(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{gi^3(c+dx)(bc-ad)^3}-$$

```
[Out] -(B*n*(4*b - (d*(a + b*x))/(c + d*x))^2)/(4*(b*c - a*d)^3*g*i^3) + (d^2*(a
+ b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g*i^3*(c
+ d*x)^2) - (2*b*d*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c
- a*d)^3*g*i^3*(c + d*x)) + (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log
[(a + b*x)/(c + d*x)])/((b*c - a*d)^3*g*i^3) - (b^2*B*n*Log[(a + b*x)/(c +
d*x)]^2)/(2*(b*c - a*d)^3*g*i^3)
```

Rubi [C] time = 0.868867, antiderivative size = 557, normalized size of antiderivative = 2.19, number of steps used = 26, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 12, 44}

$$\frac{b^2Bn\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{gi^3(bc-ad)^3}+\frac{b^2Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{gi^3(bc-ad)^3}+\frac{b^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{gi^3(bc-ad)^3}-\frac{b^2\log(c+dx)\left(B\ldots\right.}{gi^3(\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*x)^3),
x]
```

```
[Out] -(B*n)/(4*(b*c - a*d)*g*i^3*(c + d*x)^2) - (3*b*B*n)/(2*(b*c - a*d)^2*g*i^3
*(c + d*x)) - (3*b^2*B*n*Log[a + b*x])/(2*(b*c - a*d)^3*g*i^3) - (b^2*B*n*L
og[a + b*x]^2)/(2*(b*c - a*d)^3*g*i^3) + (A + B*Log[e*((a + b*x)/(c + d*x))
^n])/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) + (b*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/((b*c - a*d)^2*g*i^3*(c + d*x)) + (b^2*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g*i^3) + (3*b^2*B*n*Log[c + d*x])/
(2*(b*c - a*d)^3*g*i^3) + (b^2*B*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/((b*c - a*d)^3*g*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*B*n*Log[c + d*x]^2)/(2*(b*c - a
*d)^3*g*i^3) + (b^2*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c
- a*d)^3*g*i^3) + (b^2*B*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c
- a*d)^3*g*i^3) + (b^2*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a
*d)^3*g*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(155c+155dx)^3(ag+bgx)}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^3g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)g(c+dx)^3} - \frac{bd\left(A+B\log\right.}{3723875(bc-a}\right.$$

$$= \frac{b^3\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{3723875(bc-ad)^3g} - \frac{\left(b^2d\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}dx}{3723875(bc-ad)^3g} - \frac{(bd)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}dx}{3723875(bc-ad)^2g}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\right.}{3723875(b}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\right.}{3723875(b}$$

$$= \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3723875(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\right.}{3723875(b}$$

$$= -\frac{Bn}{14895500(bc-ad)g(c+dx)^2} - \frac{3bBn}{7447750(bc-ad)^2g(c+dx)} - \frac{3b^2Bn\log(a+b}{7447750(bc-ad}$$

$$= -\frac{Bn}{14895500(bc-ad)g(c+dx)^2} - \frac{3bBn}{7447750(bc-ad)^2g(c+dx)} - \frac{3b^2Bn\log(a+b}{7447750(bc-ad}$$

$$= -\frac{Bn}{14895500(bc-ad)g(c+dx)^2} - \frac{3bBn}{7447750(bc-ad)^2g(c+dx)} - \frac{3b^2Bn\log(a+b}{7447750(bc-ad}$$

Mathematica [C] time = 0.389916, size = 434, normalized size = 1.71

$$\frac{-2b^2Bn(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2Bn(c+dx)^2\left(2\text{PolyLog}\left(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)*(c*i + d*i*
x)^3),x]
```

```
[Out] (2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)*(
c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a +
 b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d +
b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2 +
 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*
x)^2*Log[c + d*x]) - 2*b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*
Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)
]) + 2*b^2*B*n*(c + d*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c +
d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*
d)^3*g*i^3*(c + d*x)^2)
```

Maple [F] time = 0.75, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)\left(dix+ci\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 1.42133, size = 1199, normalized size = 4.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] 1/2*B*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i^3
*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a*b
*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d
 + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) - 1/4*(7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x
 + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*
x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2
)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^
2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))*B*n/(b^3*c^5*g*i^3 -
 3*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3
*d^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x
^2 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a
^3*c*d^4*g*i^3)*x) + 1/2*A*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c
*d^3 + a^2*d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3
*x + (b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c
)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))
```

Fricas [A] time = 0.555237, size = 1022, normalized size = 4.02

$$\frac{6\,Ab^{2}c^{2}-8\,Aabcd+2\,Aa^{2}d^{2}+2\left(Bb^{2}d^{2}nx^{2}+2\,Bb^{2}cdnx+Bb^{2}c^{2}n\right)\log\left(\frac{bx+a}{dx+c}\right)^{2}-\left(7\,Bb^{2}c^{2}-8\,Babcd+Ba^{2}d^{2}\right)n+2\left(2\,A\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] 1/4*(6*A*b^2*c^2 - 8*A*a*b*c*d + 2*A*a^2*d^2 + 2*(B*b^2*d^2*n*x^2 + 2*B*b^2
*c*d*n*x + B*b^2*c^2*n)*log((b*x + a)/(d*x + c))^2 - (7*B*b^2*c^2 - 8*B*a*b
```

```
*c*d + B*a^2*d^2)*n + 2*(2*A*b^2*c*d - 2*A*a*b*d^2 - 3*(B*b^2*c*d - B*a*b*d
^2)*n)*x + 2*(3*B*b^2*c^2 - 4*B*a*b*c*d + B*a^2*d^2 + 2*(B*b^2*c*d - B*a*b*
d^2)*x + 2*(B*b^2*d^2*x^2 + 2*B*b^2*c*d*x + B*b^2*c^2)*log((b*x + a)/(d*x +
 c)))*log(e) + 2*(2*A*b^2*c^2 - (3*B*b^2*d^2*n - 2*A*b^2*d^2)*x^2 - (4*B*a*
b*c*d - B*a^2*d^2)*n + 2*(2*A*b^2*c*d - (2*B*b^2*c*d + B*a*b*d^2)*n)*x)*log
((b*x + a)/(d*x + c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^4 - a^
3*d^5)*g*i^3*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^3 - a^3*c
*d^4)*g*i^3*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c^2*d^3)*g
*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{(bgx+ag)(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)*(d*i*x + c*
i)^3), x)
```

3.156 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=381

$$-\frac{b^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{3b^2d\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(bc-ad)^4}+\frac{3bd^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(c+dx)(bc-ad)^4}-$$

```
[Out] (B*d^3*n*(a + b*x)^2)/(4*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (3*b*B*d^2*n*
(a + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*B*n*(c + d*x))/((b*c -
a*d)^4*g^2*i^3*(a + b*x)) - (d^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*
(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^2*i^3*(a
 + b*x)) - (3*b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c
 + d*x)])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B*d*n*Log[(a + b*x)/(c + d*x)]^2
)/(2*(b*c - a*d)^4*g^2*i^3)
```

Rubi [C] time = 1.08323, antiderivative size = 657, normalized size of antiderivative = 1.72, number of steps used = 30, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{3b^2BdnPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4}-\frac{3b^2BdnPolyLog\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4}-\frac{3b^2d\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(bc-ad)^4}-\frac{b^2\left(B\log\left(e\right.\right.}{g^2i^3(a+}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)^3
),x]
```

```
[Out] -((b^2*B*n)/((b*c - a*d)^3*g^2*i^3*(a + b*x))) + (B*d*n)/(4*(b*c - a*d)^2*g
^2*i^3*(c + d*x)^2) + (5*b*B*d*n)/(2*(b*c - a*d)^3*g^2*i^3*(c + d*x)) + (3*
b^2*B*d*n*Log[a + b*x])/(2*(b*c - a*d)^4*g^2*i^3) + (3*b^2*B*d*n*Log[a + b*
x]^2)/(2*(b*c - a*d)^4*g^2*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (d*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2) - (2*b*d*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2*i^3*(c + d*x)) - (3*b^2*d*Log[a + b*
x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^2*i^3) - (3*b^2
*B*d*n*Log[c + d*x])/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*n*Log[-((d*(a +
 b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*d*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (
3*b^2*B*d*n*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*n*Log[a
+ b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d
*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) - (3*b
^2*B*d*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(156c+156dx)^3(ag+bgx)^2}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)^2} - \frac{b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1265472(bc-ad)^4g^2(a+bx)} + \frac{d^2\left(A+B\log\right.}{3796416(bc-\right.}$$

$$= -\frac{\left(b^3d\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{1265472(bc-ad)^4g^2} + \frac{\left(b^2d^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{1265472(bc-ad)^4g^2} + \frac{b^3\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}}{3796416(bc-ad)^3g^2}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc-ad)^2g^2(c+dx)^2} - \frac{bd\left(A+B\log\left(e\right.\right.}{1898208(bc-ad)}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc-ad)^2g^2(c+dx)^2} - \frac{bd\left(A+B\log\left(e\right.\right.}{1898208(bc-ad)}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc-ad)^2g^2(c+dx)^2} - \frac{bd\left(A+B\log\left(e\right.\right.}{1898208(bc-ad)}$$

$$= -\frac{b^2Bn}{3796416(bc-ad)^3g^2(a+bx)} + \frac{Bdn}{15185664(bc-ad)^2g^2(c+dx)^2} + \frac{5bBa}{7592832(bc-a}$$

$$= -\frac{b^2Bn}{3796416(bc-ad)^3g^2(a+bx)} + \frac{Bdn}{15185664(bc-ad)^2g^2(c+dx)^2} + \frac{5bBa}{7592832(bc-a}$$

$$= -\frac{b^2Bn}{3796416(bc-ad)^3g^2(a+bx)} + \frac{Bdn}{15185664(bc-ad)^2g^2(c+dx)^2} + \frac{5bBa}{7592832(bc-a}$$

Mathematica [C] time = 0.806644, size = 477, normalized size = 1.25

$$\frac{6b^2Bdn\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-6b^2Bdn\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*
i*x)^3),x]
```

```
[Out] ((-4*b^3*B*c*n)/(a + b*x) + (4*a*b^2*B*d*n)/(a + b*x) + (B*d*(b*c - a*d)^2*
n)/(c + d*x)^2 + (8*b^2*B*c*d*n)/(c + d*x) - (8*a*b*B*d^2*n)/(c + d*x) + (2
*b*B*d*(b*c - a*d)*n)/(c + d*x) + 6*b^2*B*d*n*Log[a + b*x] - (4*b^2*(b*c -
a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) - (2*d*(b*c - a*d)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 - (8*b*d*(b*c - a*d)*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 12*b^2*d*Log[a + b*x]*(A
```

```
 + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*b^2*B*d*n*Log[c + d*x] + 12*b^2*d*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 6*b^2*B*d*n*(Log[a +
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]) - 6*b^2*B*d*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
/(4*(b*c - a*d)^4*g^2*i^3)
```

Maple [F] time = 0.716, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(dix+ci\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 1.83472, size = 2327, normalized size = 6.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] -1/2*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a
*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g
^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d
^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*
a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a
^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a
*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*
d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^
3 + a^4*d^4)*g^2*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/4*(4*b^3*
c^3 - 15*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)
*x^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*
c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (
2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^
2 - 3*(b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*
c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(
b*x + a) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (
b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2
 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c
))*B*n/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2
*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3
 - 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^
2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2
*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^
5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3
 - 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*
g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x) - 1/2*A*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a
*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d
```

```
^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*
d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a
*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x +
 (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6
*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b
*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d
 + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3))
```

Fricas [B] time = 0.582539, size = 1956, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/4*(4*A*b^3*c^3 + 6*A*a*b^2*c^2*d - 12*A*a^2*b*c*d^2 + 2*A*a^3*d^3 + 6*(2
*A*b^3*c*d^2 - 2*A*a*b^2*d^3 - (B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2 + 6*(B*b^
3*d^3*n*x^3 + B*a*b^2*c^2*d*n + (2*B*b^3*c*d^2 + B*a*b^2*d^3)*n*x^2 + (B*b^
3*c^2*d + 2*B*a*b^2*c*d^2)*n*x)*log((b*x + a)/(d*x + c))^2 + (4*B*b^3*c^3 -
 15*B*a*b^2*c^2*d + 12*B*a^2*b*c*d^2 - B*a^3*d^3)*n + 3*(6*A*b^3*c^2*d - 4*
A*a*b^2*c*d^2 - 2*A*a^2*b*d^3 - (B*b^3*c^2*d + 2*B*a*b^2*c*d^2 - 3*B*a^2*b*
d^3)*n)*x + 2*(2*B*b^3*c^3 + 3*B*a*b^2*c^2*d - 6*B*a^2*b*c*d^2 + B*a^3*d^3
+ 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 + 3*(3*B*b^3*c^2*d - 2*B*a*b^2*c*d^2 -
B*a^2*b*d^3)*x + 6*(B*b^3*d^3*x^3 + B*a*b^2*c^2*d + (2*B*b^3*c*d^2 + B*a*b^
2*d^3)*x^2 + (B*b^3*c^2*d + 2*B*a*b^2*c*d^2)*x)*log((b*x + a)/(d*x + c)))*l
og(e) + 2*(6*A*a*b^2*c^2*d - 3*(B*b^3*d^3*n - 2*A*b^3*d^3)*x^3 - 3*(3*B*a*b
^2*d^3*n - 4*A*b^3*c*d^2 - 2*A*a*b^2*d^3)*x^2 + (2*B*b^3*c^3 - 6*B*a^2*b*c*
d^2 + B*a^3*d^3)*n + 3*(2*A*b^3*c^2*d + 4*A*a*b^2*c*d^2 + (2*B*b^3*c^2*d -
4*B*a*b^2*c*d^2 - B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^5*c^4*d^
2 - 4*a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a^4*b*d^6)*g^2*
i^3*x^3 + (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2*c^
2*d^4 - 2*a^4*b*c*d^5 + a^5*d^6)*g^2*i^3*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d - 2
*a^2*b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*i
^3*x + (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 +
 a^5*c^2*d^4)*g^2*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}{\left(bgx + ag\right)^{2} (dix + ci)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^2*(d*i*x +
c*i)^3), x)
```

3.157 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=483

$$\frac{6b^2d^2\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^3(bc-ad)^5}-\frac{b^4(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b^3d(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^3(a+bx)(bc-ad)^5}-$$

```
[Out] -(B*d^4*n*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (4*b*B*d^3*n
*(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*B*d*n*(c + d*x))/((b
*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*n*(c + d*x)^2)/(4*(b*c - a*d)^5*g^3
*i^3*(a + b*x)^2) + (d^4*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c +
 d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^3*i^3*(a + b
*x)) - (b^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a
*d)^5*g^3*i^3*(a + b*x)^2) + (6*b^2*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^5*g^3*i^3) - (3*b^2*B*d^2*n*Log[
(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i^3)
```

Rubi [C] time = 1.38898, antiderivative size = 701, normalized size of antiderivative = 1.45, number of steps used = 34, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{6b^2Bd^2n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5}+\frac{6b^2Bd^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5}+\frac{6b^2d^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i^3(bc-ad)^5}-\frac{6b^2d^2\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)^3
),x]
```

```
[Out] -(b^2*B*n)/(4*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (7*b^2*B*d*n)/(2*(b*c -
a*d)^4*g^3*i^3*(a + b*x)) - (B*d^2*n)/(4*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2)
 - (7*b*B*d^2*n)/(2*(b*c - a*d)^4*g^3*i^3*(c + d*x)) - (3*b^2*B*d^2*n*Log[a
 + b*x]^2)/((b*c - a*d)^5*g^3*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]))/(2*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (3*b^2*d*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^3*(a + b*x)) + (d^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) + (3*b*d^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^3*(c + d*x))
 + (6*b^2*d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a
*d)^5*g^3*i^3) + (6*b^2*B*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d
*x])/((b*c - a*d)^5*g^3*i^3) - (6*b^2*d^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (3*b^2*B*d^2*n*Log[c + d*x]^2
)/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(
b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B*d^2*n*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B*d^2*n*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(157c+157dx)^3(ag+bgx)^3}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)^2} + \frac{6b^3d^2\left(A+B\right.}{3869893(bc-\right.}$$

$$= \frac{\left(6b^3d^2\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{3869893(bc-ad)^5g^3} - \frac{\left(6b^2d^3\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{3869893(bc-ad)^5g^3} - \frac{\left(3b^3d\right)\int \frac{A+B\log\left(e\left(\frac{a+}{c+}\right.\right.}{(a+bx)^2}}{3869893(bc-ad}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\log\right.}{7739786(bc-ad}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\log\right.}{7739786(bc-ad}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+B\log\right.}{7739786(bc-ad}$$

$$= -\frac{b^2Bn}{15479572(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn}{7739786(bc-ad)^4g^3(a+bx)} - \frac{Bd}{15479572(bc-}$$

$$= -\frac{b^2Bn}{15479572(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn}{7739786(bc-ad)^4g^3(a+bx)} - \frac{Bd}{15479572(bc-}$$

$$= -\frac{b^2Bn}{15479572(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn}{7739786(bc-ad)^4g^3(a+bx)} - \frac{Bd}{15479572(bc-}$$

Mathematica [C] time = 1.35937, size = 561, normalized size = 1.16

$$-\frac{12b^2Bd^2n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-12b^2Bd^2n\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\text{lo}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*
i*x)^3),x]
```

```
[Out] -((b^2*B*(b*c - a*d)^2*n)/(a + b*x)^2 - (12*b^3*B*c*d*n)/(a + b*x) + (12*a*
b^2*B*d^2*n)/(a + b*x) - (2*b^2*B*d*(b*c - a*d)*n)/(a + b*x) + (B*d^2*(b*c
- a*d)^2*n)/(c + d*x)^2 + (12*b^2*B*c*d^2*n)/(c + d*x) - (12*a*b*B*d^3*n)/(
```

```
c + d*x) + (2*b*B*d^2*(b*c - a*d)*n)/(c + d*x) + (2*b^2*(b*c - a*d)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 - (12*b^2*d*(b*c - a*d)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) - (2*d^2*(b*c - a*d)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 - (12*b*d^2*(b*c - a*d)*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 24*b^2*d^2*Log[a + b*x]*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*b^2*d^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[c + d*x] + 12*b^2*B*d^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]
) - 12*b^2*B*d^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Lo
g[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^5*g^3
*i^3)
```

Maple [F] time = 0.745, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 1.90219, size = 3217, normalized size = 6.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3
+ 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3
)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5
+ a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3
*d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*
c^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)
*g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b
^2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*
b^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 1
2*b^2*d^2*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*
a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x +
c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*
a^4*b*c*d^4 - a^5*d^5)*g^3*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1
/4*(b^4*c^4 - 16*a*b^3*c^3*d + 30*a^2*b^2*c^2*d^2 - 16*a^3*b*c*d^3 + a^4*d^
4 - 12*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 12*(b^4*d^4*x^4 +
a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*
d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)^
2 - 24*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^
4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c
*d^3)*x)*log(b*x + a)*log(d*x + c) + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*
(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x
^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(d*x + c)^2 - 12*(b^4*c^3*d -
```

```
a*b^3*c^2*d^2 - a^2*b^2*c*d^3 + a^3*b*d^4)*x)*B*n/(a^2*b^5*c^7*g^3*i^3 - 5*
a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^2*c^4*d^3*g^3
*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^5*d^2*g^3*i^3
 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a^3*b^4*c^2*d^
5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4 + 2*(b^7*c^6
*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i^3 - 5*a^4*b^
3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^3)*x^3 + (b^7
*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3 + 25*a^3*b^4
*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2*d^5*g^3*i^3 +
 a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3*i^3 - 4*a^2*
b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3*d^4*g^3*i^3 +
 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x) + 1/2*A*((12*b^3*d^3*x^3 -
 b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*
d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((b^6*c^4*d^2 - 4*a
*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 + a^4*b^2*d^6)*g^3*i^3*x
^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*d^3 + 2*a^3*b^3*c^2*d^4
 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c^6 - 9*a^2*b^4*c^4*d^2
+ 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)*g^3*i^3*x^2 + 2*(a*b^5*
c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^2*c^3*d^3 - 3*a^5*b*c^2
*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b^3*c^5*d + 6*a^4*b^2*c^
4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 12*b^2*d^2*log(b*x + a)/(
(b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*
b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c
^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g
^3*i^3))
```

Fricas [B] time = 0.684744, size = 2859, normalized size = 5.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/4*(2*A*b^4*c^4 - 16*A*a*b^3*c^3*d + 16*A*a^3*b*c*d^3 - 2*A*a^4*d^4 - 24*
(A*b^4*c*d^3 - A*a*b^3*d^4)*x^3 - 12*(3*A*b^4*c^2*d^2 - 3*A*a^2*b^2*d^4 + (
B*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n)*x^2 - 12*(B*b^4*d^4*n*x
^4 + B*a^2*b^2*c^2*d^2*n + 2*(B*b^4*c*d^3 + B*a*b^3*d^4)*n*x^3 + (B*b^4*c^2
*d^2 + 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n*x^2 + 2*(B*a*b^3*c^2*d^2 + B*a^2*
b^2*c*d^3)*n*x)*log((b*x + a)/(d*x + c))^2 + (B*b^4*c^4 - 16*B*a*b^3*c^3*d
+ 30*B*a^2*b^2*c^2*d^2 - 16*B*a^3*b*c*d^3 + B*a^4*d^4)*n - 4*(2*A*b^4*c^3*d
 + 12*A*a*b^3*c^2*d^2 - 12*A*a^2*b^2*c*d^3 - 2*A*a^3*b*d^4 + 3*(B*b^4*c^3*d
 - B*a*b^3*c^2*d^2 - B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*n)*x + 2*(B*b^4*c^4 - 8
*B*a*b^3*c^3*d + 8*B*a^3*b*c*d^3 - B*a^4*d^4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^
4)*x^3 - 18*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*x^2 - 4*(B*b^4*c^3*d + 6*B*a*b^
3*c^2*d^2 - 6*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*x - 12*(B*b^4*d^4*x^4 + B*a^2*
b^2*c^2*d^2 + 2*(B*b^4*c*d^3 + B*a*b^3*d^4)*x^3 + (B*b^4*c^2*d^2 + 4*B*a*b^
3*c*d^3 + B*a^2*b^2*d^4)*x^2 + 2*(B*a*b^3*c^2*d^2 + B*a^2*b^2*c*d^3)*x)*log
((b*x + a)/(d*x + c)))*log(e) - 2*(12*A*b^4*d^4*x^4 + 12*A*a^2*b^2*c^2*d^2
+ 12*(2*A*b^4*c*d^3 + 2*A*a*b^3*d^4 + (B*b^4*c*d^3 - B*a*b^3*d^4)*n)*x^3 +
6*(2*A*b^4*c^2*d^2 + 8*A*a*b^3*c*d^3 + 2*A*a^2*b^2*d^4 + 3*(B*b^4*c^2*d^2 -
 B*a^2*b^2*d^4)*n)*x^2 - (B*b^4*c^4 - 8*B*a*b^3*c^3*d + 8*B*a^3*b*c*d^3 - B
*a^4*d^4)*n + 4*(6*A*a*b^3*c^2*d^2 + 6*A*a^2*b^2*c*d^3 + (B*b^4*c^3*d + 6*B
*a*b^3*c^2*d^2 - 6*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*n)*x)*log((b*x + a)/(d*x
+ c)))/((b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^
2*d^5 + 5*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*i^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6
```

```
*c^5*d^2 + 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*
d^7)*g^3*i^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*
c^4*d^3 - 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g
^3*i^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2
*c^3*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*i^3*x + (a^2*b^5*c^7 - 5*a^3*b^
4*c^6*d + 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c
^2*d^5)*g^3*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**3/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}{\left(bgx + ag\right)^{3} (dix + ci)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^3*(d*i*x +
c*i)^3), x)
```

3.158 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=587

$$-\frac{10b^3d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^3(a+bx)(bc-ad)^6}-\frac{10b^2d^3\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^3(bc-ad)^6}-\frac{b^5(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}{3g^4i^3(a+bx)^3(bc-ad)^6}$$

```
[Out] (B*d^5*n*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (5*b*B*d^4*n*
(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*B*d^2*n*(c + d*x))/(
(b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*n*(c + d*x)^2)/(4*(b*c - a*d)
^6*g^4*i^3*(a + b*x)^2) - (b^5*B*n*(c + d*x)^3)/(9*(b*c - a*d)^6*g^4*i^3*(a
 + b*x)^3) - (d^5*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b
*c - a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x
)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^6*g^4*i^3*(a + b*x))
 + (5*b^4*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a
*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^6*g^4*i^3
) + (5*b^2*B*d^3*n*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3)
```

Rubi [C] time = 1.69149, antiderivative size = 859, normalized size of antiderivative = 1.46, number of steps used = 38, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{5b^2Bn\log^2(a+bx)d^3}{(bc-ad)^6g^4i^3}+\frac{5b^2Bn\log^2(c+dx)d^3}{(bc-ad)^6g^4i^3}-\frac{10b^2Bn\log(a+bx)d^3}{3(bc-ad)^6g^4i^3}-\frac{10b^2\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^3}{(bc-ad)^6g^4i^3}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*i*x)^3
),x]
```

```
[Out] -(b^2*B*n)/(9*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (11*b^2*B*d*n)/(12*(b*c
- a*d)^4*g^4*i^3*(a + b*x)^2) - (47*b^2*B*d^2*n)/(6*(b*c - a*d)^5*g^4*i^3*(
a + b*x)) + (B*d^3*n)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B*d^3*n)
/(2*(b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*B*d^3*n*Log[a + b*x])/(3*(b*
c - a*d)^6*g^4*i^3) + (5*b^2*B*d^3*n*Log[a + b*x]^2)/((b*c - a*d)^6*g^4*i^3
) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3*g^4*i^3*(
a + b*x)^3) + (3*b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*
d)^4*g^4*i^3*(a + b*x)^2) - (6*b^2*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/((b*c - a*d)^5*g^4*i^3*(a + b*x)) - (d^3*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - (4*b*d^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*d^3*Log
[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^6*g^4*i^3) +
 (10*b^2*B*d^3*n*Log[c + d*x])/(3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*n*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) + (
10*b^2*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d
)^6*g^4*i^3) + (5*b^2*B*d^3*n*Log[c + d*x]^2)/((b*c - a*d)^6*g^4*i^3) - (10
*b^2*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^
4*i^3) - (10*b^2*B*d^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c -
a*d)^6*g^4*i^3) - (10*b^2*B*d^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((
```

```
b*c - a*d)^6*g^4*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(158c+158dx)^3(ag+bgx)^4}\,dx = \int\left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3944312(bc-ad)^3g^4(a+bx)^4} - \frac{3b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3944312(bc-ad)^4g^4(a+bx)^3} + \frac{3b^3d^2\left(A+B\right.}{1972156(bc-\right.}$$

$$= -\frac{\left(5b^3d^3\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{1972156(bc-ad)^6g^4} + \frac{\left(5b^2d^4\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{1972156(bc-ad)^6g^4} + \frac{\left(3b^3d^2\right)\int\frac{A+B\log(}{(a+}}{1972156(bc-}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc-ad)^4g^4(a+bx)^2} - \frac{3b^2d^2\left(A+B\,\mathrm{l}\right.}{1972156(bc-}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc-ad)^4g^4(a+bx)^2} - \frac{3b^2d^2\left(A+B\,\mathrm{l}\right.}{1972156(bc-}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc-ad)^3g^4(a+bx)^3} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc-ad)^4g^4(a+bx)^2} - \frac{3b^2d^2\left(A+B\,\mathrm{l}\right.}{1972156(bc-}$$

$$= -\frac{b^2Bn}{35498808(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bdn}{47331744(bc-ad)^4g^4(a+bx)^2} - \frac{47b}{23665872(bc}$$

$$= -\frac{b^2Bn}{35498808(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bdn}{47331744(bc-ad)^4g^4(a+bx)^2} - \frac{47b}{23665872(bc}$$

$$= -\frac{b^2Bn}{35498808(bc-ad)^3g^4(a+bx)^3} + \frac{11b^2Bdn}{47331744(bc-ad)^4g^4(a+bx)^2} - \frac{47b}{23665872(bc}$$

Mathematica [C] time = 2.08042, size = 671, normalized size = 1.14

$$-\frac{-180b^2Bd^3n\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+180b^2Bd^3n\left(2\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*
i*x)^3),x]
```

```
[Out] -((4*b^2*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (33*b^2*B*d*(b*c - a*d)^2*n)/(a +
 b*x)^2 + (216*b^3*B*c*d^2*n)/(a + b*x) - (216*a*b^2*B*d^3*n)/(a + b*x) + (
66*b^2*B*d^2*(b*c - a*d)*n)/(a + b*x) - (9*B*d^3*(b*c - a*d)^2*n)/(c + d*x)
^2 - (144*b^2*B*c*d^3*n)/(c + d*x) + (144*a*b*B*d^4*n)/(c + d*x) - (18*b*B*
d^3*(b*c - a*d)*n)/(c + d*x) + 120*b^2*B*d^3*n*Log[a + b*x] + (12*b^2*(b*c
- a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^3 - (54*b^2*d*(b
*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (216*b^2*
d^2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + (18*d^3
*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 + (144*b
*d^3*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 360*b^
2*d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*b^2*B*d^3*n
*Log[c + d*x] - 360*b^2*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x] - 180*b^2*B*d^3*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b
*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 180*b^2*B*d^3*n
*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)]))/(36*(b*c - a*d)^6*g^4*i^3)
```

Maple [F] time = 0.726, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}\left(dix+ci\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 3.15538, size = 5156, normalized size = 8.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] -1/6*B*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 +
 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^
4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*
c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*d^
3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d^7
)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a^3
*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4*i
^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3 -
 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^4*
i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c^4
*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g^4
*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^5*
b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*x
```

+ (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*x + a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d*x + c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/36*(4*b^5*c^5 - 45*a*b^4*c^4*d + 360*a^2*b^3*c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4 - 9*a^5*d^5 + 120*(b^5*c*d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^4*c*d^4 - a^2*b^3*d^5)*x^3 + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2*b^3*c*d^4 + 7*a^3*b^2*d^5)*x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(d*x + c)^2 - 5*(5*b^5*c^4*d - 108*a*b^4*c^3*d^2 + 78*a^2*b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x + 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a) - 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x + c))*B*n/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x) - 1/6*A*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*x + a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^

```
2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*
i^3) - 60*b^2*d^3*log(d*x + c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d
^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4
*i^3))
```

Fricas [B] time = 0.76607, size = 4535, normalized size = 7.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/36*(12*A*b^5*c^5 - 90*A*a*b^4*c^4*d + 360*A*a^2*b^3*c^3*d^2 - 120*A*a^3*
b^2*c^2*d^3 - 180*A*a^4*b*c*d^4 + 18*A*a^5*d^5 + 120*(3*A*b^5*c*d^4 - 3*A*a
*b^4*d^5 + (B*b^5*c*d^4 - B*a*b^4*d^5)*n)*x^4 + 60*(9*A*b^5*c^2*d^3 + 6*A*a
*b^4*c*d^4 - 15*A*a^2*b^3*d^5 + 2*(3*B*b^5*c^2*d^3 - 2*B*a*b^4*c*d^4 - B*a^
2*b^3*d^5)*n)*x^3 + 20*(6*A*b^5*c^3*d^2 + 63*A*a*b^4*c^2*d^3 - 36*A*a^2*b^3
*c*d^4 - 33*A*a^3*b^2*d^5 + (11*B*b^5*c^3*d^2 + 21*B*a*b^4*c^2*d^3 - 39*B*a
^2*b^3*c*d^4 + 7*B*a^3*b^2*d^5)*n)*x^2 + 180*(B*b^5*d^5*n*x^5 + B*a^3*b^2*c
^2*d^3*n + (2*B*b^5*c*d^4 + 3*B*a*b^4*d^5)*n*x^4 + (B*b^5*c^2*d^3 + 6*B*a*b
^4*c*d^4 + 3*B*a^2*b^3*d^5)*n*x^3 + (3*B*a*b^4*c^2*d^3 + 6*B*a^2*b^3*c*d^4
+ B*a^3*b^2*d^5)*n*x^2 + (3*B*a^2*b^3*c^2*d^3 + 2*B*a^3*b^2*c*d^4)*n*x)*log
((b*x + a)/(d*x + c))^2 + (4*B*b^5*c^5 - 45*B*a*b^4*c^4*d + 360*B*a^2*b^3*c
^3*d^2 - 490*B*a^3*b^2*c^2*d^3 + 180*B*a^4*b*c*d^4 - 9*B*a^5*d^5)*n - 5*(6*
A*b^5*c^4*d - 72*A*a*b^4*c^3*d^2 - 144*A*a^2*b^3*c^2*d^3 + 192*A*a^3*b^2*c*
d^4 + 18*A*a^4*b*d^5 + (5*B*b^5*c^4*d - 108*B*a*b^4*c^3*d^2 + 78*B*a^2*b^3*
c^2*d^3 + 52*B*a^3*b^2*c*d^4 - 27*B*a^4*b*d^5)*n)*x + 6*(2*B*b^5*c^5 - 15*B
*a*b^4*c^4*d + 60*B*a^2*b^3*c^3*d^2 - 20*B*a^3*b^2*c^2*d^3 - 30*B*a^4*b*c*d
^4 + 3*B*a^5*d^5 + 60*(B*b^5*c*d^4 - B*a*b^4*d^5)*x^4 + 30*(3*B*b^5*c^2*d^3
 + 2*B*a*b^4*c*d^4 - 5*B*a^2*b^3*d^5)*x^3 + 10*(2*B*b^5*c^3*d^2 + 21*B*a*b^
4*c^2*d^3 - 12*B*a^2*b^3*c*d^4 - 11*B*a^3*b^2*d^5)*x^2 - 5*(B*b^5*c^4*d - 1
2*B*a*b^4*c^3*d^2 - 24*B*a^2*b^3*c^2*d^3 + 32*B*a^3*b^2*c*d^4 + 3*B*a^4*b*d
^5)*x + 60*(B*b^5*d^5*x^5 + B*a^3*b^2*c^2*d^3 + (2*B*b^5*c*d^4 + 3*B*a*b^4*
d^5)*x^4 + (B*b^5*c^2*d^3 + 6*B*a*b^4*c*d^4 + 3*B*a^2*b^3*d^5)*x^3 + (3*B*a
*b^4*c^2*d^3 + 6*B*a^2*b^3*c*d^4 + B*a^3*b^2*d^5)*x^2 + (3*B*a^2*b^3*c^2*d^
3 + 2*B*a^3*b^2*c*d^4)*x)*log((b*x + a)/(d*x + c)))*log(e) + 6*(60*A*a^3*b^
2*c^2*d^3 + 20*(B*b^5*d^5*n + 3*A*b^5*d^5)*x^5 + 20*(5*B*b^5*c*d^4*n + 6*A*
b^5*c*d^4 + 9*A*a*b^4*d^5)*x^4 + 10*(6*A*b^5*c^2*d^3 + 36*A*a*b^4*c*d^4 + 1
8*A*a^2*b^3*d^5 + (11*B*b^5*c^2*d^3 + 18*B*a*b^4*c*d^4 - 9*B*a^2*b^3*d^5)*n
)*x^3 + 10*(18*A*a*b^4*c^2*d^3 + 36*A*a^2*b^3*c*d^4 + 6*A*a^3*b^2*d^5 + (2*
B*b^5*c^3*d^2 + 27*B*a*b^4*c^2*d^3 - 9*B*a^3*b^2*d^5)*n)*x^2 + (2*B*b^5*c^5
 - 15*B*a*b^4*c^4*d + 60*B*a^2*b^3*c^3*d^2 - 30*B*a^4*b*c*d^4 + 3*B*a^5*d^5
)*n + 5*(36*A*a^2*b^3*c^2*d^3 + 24*A*a^3*b^2*c*d^4 - (B*b^5*c^4*d - 12*B*a*
b^4*c^3*d^2 - 36*B*a^2*b^3*c^2*d^3 + 24*B*a^3*b^2*c*d^4 + 3*B*a^4*b*d^5)*n)
*x)*log((b*x + a)/(d*x + c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2*b^7*
c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 + a^6*b
^3*d^8)*g^4*i^3*x^5 + (2*b^9*c^7*d - 9*a*b^8*c^6*d^2 + 12*a^2*b^7*c^5*d^3 +
 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 + 33*a^5*b^4*c^2*d^6 - 16*a^6*b^3*c
*d^7 + 3*a^7*b^2*d^8)*g^4*i^3*x^4 + (b^9*c^8 - 18*a^2*b^7*c^6*d^2 + 52*a^3*
b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4 + 24*a^5*b^4*c^3*d^5 + 10*a^6*b^3*c^2*d^6
- 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8)*g^4*i^3*x^3 + (3*a*b^8*c^8 - 12*a^2*b^7*c
^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b^5*c^5*d^3 - 60*a^5*b^4*c^4*d^4 + 52*a^
6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 + a^9*d^8)*g^4*i^3*x^2 + (3*a^2*b^7*c^8
- 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2 - 30*a^5*b^4*c^5*d^3 + 5*a^6*b^3*c^
4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2*d^6 + 2*a^9*c*d^7)*g^4*i^3*x + (a^
```

```
3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6*d^2 - 20*a^6*b^3*c^5*d^3 + 15*
a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*d^6)*g^4*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(bgx+ag\right)^{4}(dix+ci)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^4*(d*i*x +
c*i)^3), x)
```

3.159 $\int (ag+bgx)^3(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=584

$$-\frac{B^2g^3in^2(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{10b^2d^4}-\frac{Bg^3in(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+11Bn\right)}{60b^2d^4}-\frac{Bg^3in(a}{}$$

```
[Out] (3*B^2*(b*c - a*d)^4*g^3*i*n^2*x)/(10*b*d^3) - (3*B^2*(b*c - a*d)^3*g^3*i*n
^2*(c + d*x)^2)/(20*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i*n^2*(c + d*x)^3)/(30*
d^4) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(30*b^2*d) - (B*(b*c - a*d)*g^3*i*n*(a + b*x)^4*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(10*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/(20*b^2) + (g^3*i*(a + b*x)^4*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) + (B*(b*c - a*d)^3*g^3*i*n*(a +
 b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^2*d^2) - (B
*(b*c - a*d)^4*g^3*i*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d
*x))^n]))/(60*b^2*d^3) - (B*(b*c - a*d)^5*g^3*i*n*(6*A + 11*B*n + 6*B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(60*b^2*d^4) - (
B^2*(b*c - a*d)^5*g^3*i*n^2*Log[c + d*x])/(10*b^2*d^4) - (B^2*(b*c - a*d)^5
*g^3*i*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(10*b^2*d^4)
```

Rubi [A] time = 1.90112, antiderivative size = 670, normalized size of antiderivative = 1.15, number of steps used = 52, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3in^2(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{10b^2d^4}+\frac{Bg^3in(bc-ad)^5\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{10b^2d^4}+\frac{Bg^3in(a+bx)^2(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] -(A*B*(b*c - a*d)^4*g^3*i*n*x)/(10*b*d^3) + (B^2*(b*c - a*d)^4*g^3*i*n^2*x)
/(60*b*d^3) - (B^2*(b*c - a*d)^3*g^3*i*n^2*(a + b*x)^2)/(30*b^2*d^2) + (B^2
*(b*c - a*d)^2*g^3*i*n^2*(a + b*x)^3)/(30*b^2*d) - (B^2*(b*c - a*d)^4*g^3*i
*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(10*b^2*d^3) + (B*(b*c - a*d)^
3*g^3*i*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^2*d^2)
- (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/(30*b^2*d) - (B*(b*c - a*d)*g^3*i*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(10*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2)/(4*b^2) + (d*g^3*i*(a + b*x)^5*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n])^2)/(5*b^2) + (B^2*(b*c - a*d)^5*g^3*i*n^2*Log[c + d*x]
)/(12*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*n^2*Log[-((d*(a + b*x))/(b*c - a*
d))]*Log[c + d*x])/(10*b^2*d^4) + (B*(b*c - a*d)^5*g^3*i*n*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])*Log[c + d*x])/(10*b^2*d^4) + (B^2*(b*c - a*d)^5*g^3*
i*n^2*Log[c + d*x]^2)/(20*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*n^2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(10*b^2*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
```

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (159c+159dx)(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(\frac{159(bc-ad)(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b} + \cdots\right.$$

$$= \frac{(159(bc-ad))\int (ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{b}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2} + \frac{159d\cdots}{\cdots}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2} + \frac{159d\cdots}{\cdots}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2} + \frac{159d\cdots}{\cdots}$$

$$= \frac{159(bc-ad)g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2} + \frac{159d\cdots}{\cdots}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{159B(bc-ad)^3g^3n(a+bx)^2\left(A\cdots\right.}{20b^2d^2}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} - \frac{159B^2(bc-ad)^4g^3n(a+bx)\log\cdots}{10b^2d^3}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} - \frac{159B^2(bc-ad)^4g^3n(a+bx)\log\cdots}{10b^2d^3}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{53B^2(bc-ad)^4g^3n^2x}{20bd^3} - \frac{53B^2(b\cdots}{\cdots}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{53B^2(bc-ad)^4g^3n^2x}{20bd^3} - \frac{53B^2(b\cdots}{\cdots}$$

$$= -\frac{159AB(bc-ad)^4g^3nx}{10bd^3} + \frac{53B^2(bc-ad)^4g^3n^2x}{20bd^3} - \frac{53B^2(b\cdots}{\cdots}$$

Mathematica [A] time = 0.785927, size = 949, normalized size = 1.62

$$\frac{g^3i\left(4d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(a+bx)^5+5(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(a+bx)^4-\frac{5B(bc-ad)^2n\left(-6Bn\log(c+dx)(bc-ad)^3\cdots\right.}{\cdots}\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g^3*i*(5*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 4*d*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (5*B*(b*c - a*
d)^2*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a +
 b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e*((a +
b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x - d
^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n*(b*d*x
 + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a + b*x))
/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])))/(3*d^4) + (B*(b*c - a*d)*n*(24*A*b*d*(b*c - a*d)^3*x + 24*B
*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d^2*(b*c - a
*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3*(b*c - a*d
)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a + b*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] -
24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 4*B*
(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Lo
g[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)
*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*
c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d)^4*n*(
(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4)))/(20*b^2)
```

Maple [F] time = 0.526, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3}\left(dix+ci\right)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.89072, size = 5081, normalized size = 8.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 2/5*A*B*b^3*d*g^3*i*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*b^
3*d*g^3*i*x^5 + 1/2*A*B*b^3*c*g^3*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 3/2*A*B*a*b^2*d*g^3*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/
4*A^2*b^3*c*g^3*i*x^4 + 3/4*A^2*a*b^2*d*g^3*i*x^4 + 2*A*B*a*b^2*c*g^3*i*x^3
*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a^2*b*d*g^3*i*x^3*log(e*(b*
x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b^2*c*g^3*i*x^3 + A^2*a^2*b*d*g^3*i*x
^3 + 3*A*B*a^2*b*c*g^3*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*B*a
^3*d*g^3*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A^2*a^2*b*c*g^3
*i*x^2 + 1/2*A^2*a^3*d*g^3*i*x^2 + 1/30*A*B*b^3*d*g^3*i*n*(12*a^5*log(b*x +
 a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4
*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 -
```

a^4*d^4)*x)/(b^4*d^4)) - 1/12*A*B*b^3*c*g^3*i*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/4*A*B*a*b^2*d*g^3*i*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*a*b^2*c*g^3*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + A*B*a^2*b*d*g^3*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*a^2*b*c*g^3*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - A*B*a^3*d*g^3*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^3*c*g^3*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*a^3*c*g^3*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a^3*c*g^3*i*x - 1/60*(6*a^4*c*d^4*g^3*i*n^2 - (5*g^3*i*n^2 + 6*g^3*i*n*log(e))*b^4*c^5 + (19*g^3*i*n^2 + 30*g^3*i*n*log(e))*a*b^3*c^4*d - (23*g^3*i*n^2 + 60*g^3*i*n*log(e))*a^2*b^2*c^3*d^2 + 3*(g^3*i*n^2 + 20*g^3*i*n*log(e))*a^3*b*c^2*d^3)*B^2*log(d*x + c)/(b*d^4) + 1/10*(b^5*c^5*g^3*i*n^2 - 5*a*b^4*c^4*d*g^3*i*n^2 + 10*a^2*b^3*c^3*d^2*g^3*i*n^2 - 10*a^3*b^2*c^2*d^3*g^3*i*n^2 + 5*a^4*b*c*d^4*g^3*i*n^2 - a^5*d^5*g^3*i*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^4) + 1/60*(12*B^2*b^5*d^5*g^3*i*x^5*log(e)^2 - 3*((2*g^3*i*n*log(e) - 5*g^3*i*log(e)^2)*b^5*c*d^4 - (2*g^3*i*n*log(e) + 15*g^3*i*log(e)^2)*a*b^4*d^5)*B^2*x^4 + 2*((g^3*i*n^2 - g^3*i*n*log(e))*b^5*c^2*d^3 - 2*(g^3*i*n^2 + 5*g^3*i*n*log(e) - 15*g^3*i*log(e)^2)*a*b^4*c*d^4 + (g^3*i*n^2 + 11*g^3*i*n*log(e) + 30*g^3*i*log(e)^2)*a^2*b^3*d^5)*B^2*x^3 - ((2*g^3*i*n^2 - 3*g^3*i*n*log(e))*b^5*c^3*d^2 - 3*(4*g^3*i*n^2 - 5*g^3*i*n*log(e))*a*b^4*c^2*d^3 + 3*(6*g^3*i*n^2 + 5*g^3*i*n*log(e) - 30*g^3*i*log(e)^2)*a^2*b^3*c*d^4 - (8*g^3*i*n^2 + 27*g^3*i*n*log(e) + 30*g^3*i*log(e)^2)*a^3*b^2*d^5)*B^2*x^2 - 3*(5*a^4*b*c*d^4*g^3*i*n^2 - a^5*d^5*g^3*i*n^2)*B^2*log(b*x + a)^2 - 6*(b^5*c^5*g^3*i*n^2 - 5*a*b^4*c^4*d*g^3*i*n^2 + 10*a^2*b^3*c^3*d^2*g^3*i*n^2 - 10*a^3*b^2*c^2*d^3*g^3*i*n^2)*B^2*log(b*x + a)*log(d*x + c) + 3*(b^5*c^5*g^3*i*n^2 - 5*a*b^4*c^4*d*g^3*i*n^2 + 10*a^2*b^3*c^3*d^2*g^3*i*n^2 - 10*a^3*b^2*c^2*d^3*g^3*i*n^2)*B^2*log(d*x + c)^2 + ((g^3*i*n^2 - 6*g^3*i*n*log(e))*b^5*c^4*d - 2*(4*g^3*i*n^2 - 15*g^3*i*n*log(e))*a*b^4*c^3*d^2 + 12*(2*g^3*i*n^2 - 5*g^3*i*n*log(e))*a^2*b^3*c^2*d^3 - 2*(14*g^3*i*n^2 - 15*g^3*i*n*log(e) - 30*g^3*i*log(e)^2)*a^3*b^2*c*d^4 + (11*g^3*i*n^2 + 6*g^3*i*n*log(e))*a^4*b*d^5)*B^2*x - (6*a*b^4*c^4*d*g^3*i*n^2 - 27*a^2*b^3*c^3*d^2*g^3*i*n^2 + 47*a^3*b^2*c^2*d^3*g^3*i*n^2 - (31*g^3*i*n^2 + 30*g^3*i*n*log(e))*a^4*b*c*d^4 + (5*g^3*i*n^2 + 6*g^3*i*n*log(e))*a^5*d^5)*B^2*log(b*x + a) + 3*(4*B^2*b^5*d^5*g^3*i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3*i*x + 5*(b^5*c*d^4*g^3*i + 3*a*b^4*d^5*g^3*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3*i + a^2*b^3*d^5*g^3*i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*g^3*i)*B^2*x^2)*log((b*x + a)^n)^2 + 3*(4*B^2*b^5*d^5*g^3*i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3*i*x + 5*(b^5*c*d^4*g^3*i + 3*a*b^4*d^5*g^3*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3*i + a^2*b^3*d^5*g^3*i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*g^3*i)*B^2*x^2)*log((d*x + c)^n)^2 + (24*B^2*b^5*d^5*g^3*i*x^5*log(e) - 6*((g^3*i*n - 5*g^3*i*log(e))*b^5*c*d^4 - (g^3*i*n + 15*g^3*i*log(e))*a*b^4*d^5)*B^2*x^4 - 2*(b^5*c^2*d^3*g^3*i*n + 10*(g^3*i*n - 6*g^3*i*log(e))*a*b^4*c*d^4 - (11*g^3*i*n + 60*g^3*i*log(e))*a^2*b^3*d^5)*B^2*x^3 + 3*(b^5*c^3*d^2*g^3*i*n - 5*a*b^4*c^2*d^3*g^3*i*n - 5*(g^3*i*n - 12*g^3*i*log(e))*a^2*b^3*c*d^4 + (9*g^3*i*n + 20*g^3*i*log(e))*a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4*d*g^3*i*n - 5*a*b^4*c^3*d^2*g^3*i*n + 10*a^2*b^3*c^2*d^3*g^3*i*n - a^4*b*d^5*g^3*i*n - 5*(g^3*i*n + 4*g^3*i*log(e))*a^3*b^2*c*d^4)*B^2*x + 6*(5*a^4*b*c*d^4*g^3*i*n - a^5*d^5*g^3*i*n)*B^2*log(b*x + a) + 6*(b^5*c^5*g^3*i*n - 5*a*b^4*c^4*d*g^3*i*n + 10*a^2*b^3*c^3*d^2*g^3*i*n - 10*a^3*b^2*c^2*d^3*g^3*i*n)*B^2*log(d*x + c))*log((b*x + a)^n) - (24*B^2*b^5*d^5*g^3*i*x^5*log(e) - 6*((g^3*i*n - 5*g^3*i*log(e))*b^5*c*d^4 - (g^3*i*n + 15*g^3*i*log(e))*a*b^4*d^5)*B^2*x^4 - 2*(b^5*c^2*d^3*g^3*i*n + 10*(g^3*i*n - 6*g^3*i*log(e))*a*b^4*c*d^4 - (11*g^3*i*n + 60*g^3*i*log(e))*a^2*b^3*d^5)*B^2*x^3 + 3*(b^5*c^3*d^2*g^3*i*n - 5*a*b^4*c^2*d^3*g^3*i*n - 5

```
*(g^3*i*n - 12*g^3*i*log(e))*a^2*b^3*c*d^4 + (9*g^3*i*n + 20*g^3*i*log(e))*
a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4*d*g^3*i*n - 5*a*b^4*c^3*d^2*g^3*i*n + 10*
a^2*b^3*c^2*d^3*g^3*i*n - a^4*b*d^5*g^3*i*n - 5*(g^3*i*n + 4*g^3*i*log(e))*
a^3*b^2*c*d^4)*B^2*x + 6*(5*a^4*b*c*d^4*g^3*i*n - a^5*d^5*g^3*i*n)*B^2*log(
b*x + a) + 6*(b^5*c^5*g^3*i*n - 5*a*b^4*c^4*d*g^3*i*n + 10*a^2*b^3*c^3*d^2*
g^3*i*n - 10*a^3*b^2*c^2*d^3*g^3*i*n)*B^2*log(d*x + c) + 6*(4*B^2*b^5*d^5*g
^3*i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3*i*x + 5*(b^5*c*d^4*g^3*i + 3*a*b^4*d^5*
g^3*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3*i + a^2*b^3*d^5*g^3*i)*B^2*x^3 + 10*(3
*a^2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*g^3*i)*B^2*x^2)*log((b*x + a)^n))*log((d
*x + c)^n))/(b^2*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3dg^3ix^4 + A^2a^3cg^3i + \left(A^2b^3c + 3\,A^2ab^2d\right)g^3ix^3 + 3\left(A^2ab^2c + A^2a^2bd\right)g^3ix^2 + \left(3\,A^2a^2bc + A^2a^3d\right)g^3ix\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] integral(A^2*b^3*d*g^3*i*x^4 + A^2*a^3*c*g^3*i + (A^2*b^3*c + 3*A^2*a*b^2*d
)*g^3*i*x^3 + 3*(A^2*a*b^2*c + A^2*a^2*b*d)*g^3*i*x^2 + (3*A^2*a^2*b*c + A^
2*a^3*d)*g^3*i*x + (B^2*b^3*d*g^3*i*x^4 + B^2*a^3*c*g^3*i + (B^2*b^3*c + 3*
B^2*a*b^2*d)*g^3*i*x^3 + 3*(B^2*a*b^2*c + B^2*a^2*b*d)*g^3*i*x^2 + (3*B^2*a
^2*b*c + B^2*a^3*d)*g^3*i*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*
d*g^3*i*x^4 + A*B*a^3*c*g^3*i + (A*B*b^3*c + 3*A*B*a*b^2*d)*g^3*i*x^3 + 3*(
A*B*a*b^2*c + A*B*a^2*b*d)*g^3*i*x^2 + (3*A*B*a^2*b*c + A*B*a^3*d)*g^3*i*x)
*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 (dix + ci)\left(B\log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) +
 A)^2, x)
```

3.160 $\int (ag+bgx)^2(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=487

$$\frac{B^2g^2in^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{6b^2d^3}+\frac{Bg^2in(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+3Bn\right)}{12b^2d^3}+\frac{Bg^2in(a+bx)}{}$$

```
[Out] -(B^2*(b*c - a*d)^3*g^2*i*n^2*x)/(3*b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*n^2*(
c + d*x)^2)/(12*d^3) - (B*(b*c - a*d)^2*g^2*i*n*(a + b*x)^2*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*n*(a + b*x)^3*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x
)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(12*b^2) + (g^2*i*(a + b*x)^3
*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b) + (B*(b*c - a*d)
^3*g^2*i*n*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))/(12*
b^2*d^2) + (B*(b*c - a*d)^4*g^2*i*n*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(12*b^2*d^3) + (B^2*(b*c - a*d)
^4*g^2*i*n^2*Log[c + d*x])/(6*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2*PolyL
og[2, (d*(a + b*x))/(b*(c + d*x))])/(6*b^2*d^3)
```

Rubi [A] time = 1.58632, antiderivative size = 578, normalized size of antiderivative = 1.19, number of steps used = 44, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^2in^2(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{6b^2d^3}-\frac{Bg^2in(bc-ad)^4\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6b^2d^3}-\frac{Bg^2in(a+bx)^2(bc-ad)^2}{12}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] (A*B*(b*c - a*d)^3*g^2*i*n*x)/(6*b*d^2) - (B^2*(b*c - a*d)^3*g^2*i*n^2*x)/(
12*b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*n^2*(a + b*x)^2)/(12*b^2*d) + (B^2*(b*
c - a*d)^3*g^2*i*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(6*b^2*d^2) -
(B*(b*c - a*d)^2*g^2*i*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*Log[e*((a +
b*x)/(c + d*x))^n])^2)/(3*b^2) + (d*g^2*i*(a + b*x)^4*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2)/(4*b^2) - (B^2*(b*c - a*d)^4*g^2*i*n^2*Log[c + d*x])/(
12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))
]*Log[c + d*x])/(6*b^2*d^3) - (B*(b*c - a*d)^4*g^2*i*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[c + d*x])/(6*b^2*d^3) - (B^2*(b*c - a*d)^4*g^2*i*n^2
*Log[c + d*x]^2)/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/(6*b^2*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (160c+160dx)(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx=\int\left(\frac{160(bc-ad)(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b}\right.$$

$$=\frac{(160(bc-ad))\int(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b}$$

$$=\frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2}+$$

$$=\frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2}+$$

$$=\frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2}+$$

$$=\frac{160(bc-ad)g^2(a+bx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2}+$$

$$=\frac{80AB(bc-ad)^3g^2nx}{3bd^2}-\frac{40B(bc-ad)^2g^2n(a+bx)^2\left(A\right.}{3b^2d}$$

$$=\frac{80AB(bc-ad)^3g^2nx}{3bd^2}+\frac{80B^2(bc-ad)^3g^2n(a+bx)\log}{3b^2d^2}$$

$$=\frac{80AB(bc-ad)^3g^2nx}{3bd^2}+\frac{80B^2(bc-ad)^3g^2n(a+bx)\log}{3b^2d^2}$$

$$=\frac{80AB(bc-ad)^3g^2nx}{3bd^2}-\frac{40B^2(bc-ad)^3g^2n^2x}{3bd^2}+\frac{40B^2(}{}$$

$$=\frac{80AB(bc-ad)^3g^2nx}{3bd^2}-\frac{40B^2(bc-ad)^3g^2n^2x}{3bd^2}+\frac{40B^2(}{}$$

$$=\frac{80AB(bc-ad)^3g^2nx}{3bd^2}-\frac{40B^2(bc-ad)^3g^2n^2x}{3bd^2}+\frac{40B^2(}{}$$

Mathematica [A] time = 0.57614, size = 716, normalized size = 1.47

$$g^2i\left(\frac{4Bn(bc-ad)^2\left(Bn(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-d^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\right.}{d^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g^2*i*(4*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 3*d*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (4*B*(b*c - a*
d)^2*n*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x
)/(c + d*x))^n] - d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) -
2*B*(b*c - a*d)^2*n*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(b*d*x + (-(b*c) + a*d)*Log[c
 + d*x]) + B*(b*c - a*d)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3 - (B*
(b*c - a*d)*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d
)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n
*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])))/d^3))/(12*b^2)
```

Maple [F] time = 0.517, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2} \left(dix+ci\right) \left(A+B\ln \left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.54552, size = 3633, normalized size = 7.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 1/2*A*B*b^2*d*g^2*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*b^
2*d*g^2*i*x^4 + 2/3*A*B*b^2*c*g^2*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 4/3*A*B*a*b*d*g^2*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*
A^2*b^2*c*g^2*i*x^3 + 2/3*A^2*a*b*d*g^2*i*x^3 + 2*A*B*a*b*c*g^2*i*x^2*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n) + A*B*a^2*d*g^2*i*x^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n) + A^2*a*b*c*g^2*i*x^2 + 1/2*A^2*a^2*d*g^2*i*x^2 - 1/12*
A*B*b^2*d*g^2*i*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^
3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3
*d^3)*x)/(b^3*d^3)) + 1/3*A*B*b^2*c*g^2*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3
*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^
2*d^2)) + 2/3*A*B*a*b*d*g^2*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*
A*B*a*b*c*g^2*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d
)*x/(b*d)) - A*B*a^2*d*g^2*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^2*c*g^2*i*n*(a*log(b*x + a)/b - c*log(d*x
 + c)/d) + 2*A*B*a^2*c*g^2*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2
```

```
*a^2*c*g^2*i*x - 1/12*(2*a^3*c*d^3*g^2*i*n^2 + (g^2*i*n^2 + 2*g^2*i*n*log(e
))*b^3*c^4 - 2*(g^2*i*n^2 + 4*g^2*i*n*log(e))*a*b^2*c^3*d - (g^2*i*n^2 - 12
*g^2*i*n*log(e))*a^2*b*c^2*d^2)*B^2*log(d*x + c)/(b*d^3) - 1/6*(b^4*c^4*g^2
*i*n^2 - 4*a*b^3*c^3*d*g^2*i*n^2 + 6*a^2*b^2*c^2*d^2*g^2*i*n^2 - 4*a^3*b*c*
d^3*g^2*i*n^2 + a^4*d^4*g^2*i*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a
*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^3) + 1/12*(3*B^2*b
^4*d^4*g^2*i*x^4*log(e)^2 - 2*((g^2*i*n*log(e) - 2*g^2*i*log(e)^2)*b^4*c*d^
3 - (g^2*i*n*log(e) + 4*g^2*i*log(e)^2)*a*b^3*d^4)*B^2*x^3 + ((g^2*i*n^2 -
g^2*i*n*log(e))*b^4*c^2*d^2 - 2*(g^2*i*n^2 + 2*g^2*i*n*log(e) - 6*g^2*i*log
(e)^2)*a*b^3*c*d^3 + (g^2*i*n^2 + 5*g^2*i*n*log(e) + 6*g^2*i*log(e)^2)*a^2*
b^2*d^4)*B^2*x^2 - (4*a^3*b*c*d^3*g^2*i*n^2 - a^4*d^4*g^2*i*n^2)*B^2*log(b*
x + a)^2 + 2*(b^4*c^4*g^2*i*n^2 - 4*a*b^3*c^3*d*g^2*i*n^2 + 6*a^2*b^2*c^2*d
^2*g^2*i*n^2)*B^2*log(b*x + a)*log(d*x + c) - (b^4*c^4*g^2*i*n^2 - 4*a*b^3*
c^3*d*g^2*i*n^2 + 6*a^2*b^2*c^2*d^2*g^2*i*n^2)*B^2*log(d*x + c)^2 - ((g^2*i
*n^2 - 2*g^2*i*n*log(e))*b^4*c^3*d - (5*g^2*i*n^2 - 8*g^2*i*n*log(e))*a*b^3
*c^2*d^2 + (7*g^2*i*n^2 - 4*g^2*i*n*log(e) - 12*g^2*i*log(e)^2)*a^2*b^2*c*d
^3 - (3*g^2*i*n^2 + 2*g^2*i*n*log(e))*a^3*b*d^4)*B^2*x + (2*a*b^3*c^3*d*g^2
*i*n^2 - 7*a^2*b^2*c^2*d^2*g^2*i*n^2 + 2*(3*g^2*i*n^2 + 4*g^2*i*n*log(e))*a
^3*b*c*d^3 - (g^2*i*n^2 + 2*g^2*i*n*log(e))*a^4*d^4)*B^2*log(b*x + a) + (3*
B^2*b^4*d^4*g^2*i*x^4 + 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*(b^4*c*d^3*g^2*i +
 2*a*b^3*d^4*g^2*i)*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^2*b^2*d^4*g^2*i)*B
^2*x^2)*log((b*x + a)^n)^2 + (3*B^2*b^4*d^4*g^2*i*x^4 + 12*B^2*a^2*b^2*c*d^
3*g^2*i*x + 4*(b^4*c*d^3*g^2*i + 2*a*b^3*d^4*g^2*i)*B^2*x^3 + 6*(2*a*b^3*c*
d^3*g^2*i + a^2*b^2*d^4*g^2*i)*B^2*x^2)*log((d*x + c)^n)^2 + (6*B^2*b^4*d^4
*g^2*i*x^4*log(e) - 2*((g^2*i*n - 4*g^2*i*log(e))*b^4*c*d^3 - (g^2*i*n + 8*
g^2*i*log(e))*a*b^3*d^4)*B^2*x^3 - (b^4*c^2*d^2*g^2*i*n + 4*(g^2*i*n - 6*g^
2*i*log(e))*a*b^3*c*d^3 - (5*g^2*i*n + 12*g^2*i*log(e))*a^2*b^2*d^4)*B^2*x^
2 + 2*(b^4*c^3*d*g^2*i*n - 4*a*b^3*c^2*d^2*g^2*i*n + a^3*b*d^4*g^2*i*n + 2*
(g^2*i*n + 6*g^2*i*log(e))*a^2*b^2*c*d^3)*B^2*x + 2*(4*a^3*b*c*d^3*g^2*i*n
- a^4*d^4*g^2*i*n)*B^2*log(b*x + a) - 2*(b^4*c^4*g^2*i*n - 4*a*b^3*c^3*d*g^
2*i*n + 6*a^2*b^2*c^2*d^2*g^2*i*n)*B^2*log(d*x + c))*log((b*x + a)^n) - (6*
B^2*b^4*d^4*g^2*i*x^4*log(e) - 2*((g^2*i*n - 4*g^2*i*log(e))*b^4*c*d^3 - (g
^2*i*n + 8*g^2*i*log(e))*a*b^3*d^4)*B^2*x^3 - (b^4*c^2*d^2*g^2*i*n + 4*(g^2
*i*n - 6*g^2*i*log(e))*a*b^3*c*d^3 - (5*g^2*i*n + 12*g^2*i*log(e))*a^2*b^2*
d^4)*B^2*x^2 + 2*(b^4*c^3*d*g^2*i*n - 4*a*b^3*c^2*d^2*g^2*i*n + a^3*b*d^4*g
^2*i*n + 2*(g^2*i*n + 6*g^2*i*log(e))*a^2*b^2*c*d^3)*B^2*x + 2*(4*a^3*b*c*d
^3*g^2*i*n - a^4*d^4*g^2*i*n)*B^2*log(b*x + a) - 2*(b^4*c^4*g^2*i*n - 4*a*b
^3*c^3*d*g^2*i*n + 6*a^2*b^2*c^2*d^2*g^2*i*n)*B^2*log(d*x + c) + 2*(3*B^2*b
^4*d^4*g^2*i*x^4 + 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*(b^4*c*d^3*g^2*i + 2*a*
b^3*d^4*g^2*i)*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^2*b^2*d^4*g^2*i)*B^2*x^
2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2dg^2ix^3 + A^2a^2cg^2i + \left(A^2b^2c + 2\,A^2abd\right)g^2ix^2 + \left(2\,A^2abc + A^2a^2d\right)g^2ix + \left(B^2b^2dg^2ix^3 + B^2a^2cg^2i + \left(B\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] integral(A^2*b^2*d*g^2*i*x^3 + A^2*a^2*c*g^2*i + (A^2*b^2*c + 2*A^2*a*b*d)*
g^2*i*x^2 + (2*A^2*a*b*c + A^2*a^2*d)*g^2*i*x + (B^2*b^2*d*g^2*i*x^3 + B^2*
a^2*c*g^2*i + (B^2*b^2*c + 2*B^2*a*b*d)*g^2*i*x^2 + (2*B^2*a*b*c + B^2*a^2*
d)*g^2*i*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^2*d*g^2*i*x^3 + A*B
*a^2*c*g^2*i + (A*B*b^2*c + 2*A*B*a*b*d)*g^2*i*x^2 + (2*A*B*a*b*c + A*B*a^2
```

```
*d)*g^2*i*x)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci) \left(B \log \left(e \left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) +
 A)^2, x)
```

3.161 $\int (ag+bgx)(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=372

$$-\frac{B^2gin^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^2d^2}-\frac{Bgin(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{3b^2d^2}-\frac{Bgin(a+bx)(b}{}$$

```
[Out] (B^2*(b*c - a*d)^2*g*i*n^2*x)/(3*b*d) - (B*(b*c - a*d)^2*g*i*n*(a + b*x)*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*d) - (B*(b*c - a*d)*g*i*n*(a +
 b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2) + ((b*c - a*d)*g*i*
(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*b^2) + (g*i*(a + b
*x)^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b) - (B*(b*c -
 a*d)^3*g*i*n*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/
(b*(c + d*x))])/(3*b^2*d^2) - (B^2*(b*c - a*d)^3*g*i*n^2*Log[c + d*x])/(3*b
^2*d^2) - (B^2*(b*c - a*d)^3*g*i*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(3*b^2*d^2)
```

Rubi [B] time = 2.87827, antiderivative size = 1323, normalized size of antiderivative = 3.56, number of steps used = 72, number of rules used = 14, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.342, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 72}

$$-\frac{B^2dgin^2\log^2(a+bx)a^3}{3b^2}+\frac{2Bdgin\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)a^3}{3b^2}+\frac{2B^2dgin^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)a^3}{3b^2}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*b*B*(a^2/b^2 - c^2/d^2)*d*g*i*n*x)/3 - (A*B*(b*c - a*d)*(b*c + a*d)*g
*i*n*x)/(b*d) + (B^2*(b*c - a*d)^2*g*i*n^2*x)/(3*b*d) + (a^2*B^2*(b*c - a*d
)*g*i*n^2*Log[a + b*x])/(3*b^2) - (a^2*B^2*c*g*i*n^2*Log[a + b*x]^2)/b - (a
^3*B^2*d*g*i*n^2*Log[a + b*x]^2)/(3*b^2) + (a^2*B^2*(b*c + a*d)*g*i*n^2*Log
[a + b*x]^2)/(2*b^2) - (B^2*(b*c - a*d)*(b*c + a*d)*g*i*n*(a + b*x)*Log[e*(
(a + b*x)/(c + d*x))^n])/(3*b^2*d) - (B*(b*c - a*d)*g*i*n*x^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/3 + (2*a^2*B*c*g*i*n*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/b + (2*a^3*B*d*g*i*n*Log[a + b*x]*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/(3*b^2) - (a^2*B*(b*c + a*d)*g*i*n*Log[a + b*x]*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/b^2 + a*c*g*i*x*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2 + ((b*c + a*d)*g*i*x^2*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2)/2 + (b*d*g*i*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/3 - (B
^2*c^2*(b*c - a*d)*g*i*n^2*Log[c + d*x])/(3*d^2) + (B^2*(b*c - a*d)^2*(b*c
+ a*d)*g*i*n^2*Log[c + d*x])/(3*b^2*d^2) + (2*b*B^2*c^3*g*i*n^2*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*d^2) + (2*a*B^2*c^2*g*i*n^2*Log[-((
d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (B^2*c^2*(b*c + a*d)*g*i*n^2*L
og[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d^2 - (2*b*B*c^3*g*i*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*d^2) - (2*a*B*c^2*g*i*n*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/d + (B*c^2*(b*c + a*d)
*g*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/d^2 - (b*B^2*c^
3*g*i*n^2*Log[c + d*x]^2)/(3*d^2) - (a*B^2*c^2*g*i*n^2*Log[c + d*x]^2)/d +
(B^2*c^2*(b*c + a*d)*g*i*n^2*Log[c + d*x]^2)/(2*d^2) + (2*a^2*B^2*c*g*i*n^2
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b + (2*a^3*B^2*d*g*i*n^2*Log[
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^2) - (a^2*B^2*(b*c + a*d)*g*i
```

```
*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b^2 + (2*a^2*B^2*c*g*i*n^
2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/b + (2*a^3*B^2*d*g*i*n^2*PolyLo
g[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^2) - (a^2*B^2*(b*c + a*d)*g*i*n^2*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/b^2 + (2*b*B^2*c^3*g*i*n^2*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/(3*d^2) + (2*a*B^2*c^2*g*i*n^2*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)])/d - (B^2*c^2*(b*c + a*d)*g*i*n^2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/d^2
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (161c+161dx)(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(161acg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + 161(bc+ad)gx\left(\right.\right.$$

$$= (161acg)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx + (161bdg)\int x$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{161}{2}(bc+ad)gx^2\left(A\right.$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{161}{2}(bc+ad)gx^2\left(A\right.$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{161}{2}(bc+ad)gx^2\left(A\right.$$

$$= 161acgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{161}{2}(bc+ad)gx^2\left(A\right.$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} - \frac{161}{3}B(bc-ad)gnx^2\left(A+\right.$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} - \frac{161B^2(bc-ad)(bc+ad)g}{3b}$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} - \frac{161B^2(bc-ad)(bc+ad)g}{3b}$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} + \frac{161B^2(bc-ad)^2gn^2x}{3bd} + 1$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} + \frac{161B^2(bc-ad)^2gn^2x}{3bd} + 1$$

$$= -\frac{161AB(bc-ad)(bc+ad)gnx}{3bd} + \frac{161B^2(bc-ad)^2gn^2x}{3bd} + 1$$

Mathematica [B] time = 0.72591, size = 937, normalized size = 2.52

$$gi\left(2b^3Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)c^3 - b^3B^2n^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log(c+dx) + 2\text{PolyLog}\left(2,\frac{b(c}{bc}\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2,x]
```

```
[Out] (g*i*(-6*A*b^2*B*c*d*(b*c - a*d)*n*x + 6*a*A*b*B*d^2*(-(b*c) + a*d)*n*x + 4
*A*b*B*d*(b*c - a*d)*(b*c + a*d)*n*x - 6*b*B^2*c*d*(b*c - a*d)*n*(a + b*x)*
Log[e*((a + b*x)/(c + d*x))^n] + 6*a*B^2*d^2*(-(b*c) + a*d)*n*(a + b*x)*Log
[e*((a + b*x)/(c + d*x))^n] + 4*B^2*d*(b*c - a*d)*(b*c + a*d)*n*(a + b*x)*L
```

```
og[e*((a + b*x)/(c + d*x))^n] - 2*b^2*B*d^2*(b*c - a*d)*n*x^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) + 6*a^2*b*B*c*d^2*n*Log[a + b*x]*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]) - 2*a^3*B*d^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]) + 6*a*b^2*c*d^2*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 3*b^2*d^2*(b*c + a*d)*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 2*b^
3*d^3*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 6*b*B^2*c*(b*c - a*d)^
2*n^2*Log[c + d*x] + 6*a*B^2*d*(b*c - a*d)^2*n^2*Log[c + d*x] - 4*B^2*(b*c
- a*d)^2*(b*c + a*d)*n^2*Log[c + d*x] + 2*b^3*B*c^3*n*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])*Log[c + d*x] - 6*a*b^2*B*c^2*d*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])*Log[c + d*x] + 2*B^2*(b*c - a*d)*n^2*(a^2*d^2*Log[a + b*x] -
 b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*a^2*b*B^2*c*d^2*n^2*(Log[
a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (
d*(a + b*x))/(-(b*c) + a*d)]) + a^3*B^2*d^3*n^2*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) - b^3*B^2*c^3*n^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*a*b^2*B^2*
c^2*d*n^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(6*b^2*d^2)
```

Maple [F] time = 0.335, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)\left(dix+ci\right)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.62435, size = 2082, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, alg
orithm="maxima")
```

```
[Out] 2/3*A*B*b*d*g*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*b*d*g*
i*x^3 + A*B*b*c*g*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*B*a*d*g*
i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*b*c*g*i*x^2 + 1/2*A^
2*a*d*g*i*x^2 + 1/3*A*B*b*d*g*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x +
 c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) -
A*B*b*c*g*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/
(b*d)) - A*B*a*d*g*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c
- a*d)*x/(b*d)) + 2*A*B*a*c*g*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2
*A*B*a*c*g*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*c*g*i*x - 1/3
*(a^2*c*d^2*g*i*n^2 - b^2*c^3*g*i*n*log(e) - (g*i*n^2 - 3*g*i*n*log(e))*a*b
*c^2*d)*B^2*log(d*x + c)/(b*d^2) + 1/3*(b^3*c^3*g*i*n^2 - 3*a*b^2*c^2*d*g*i
*n^2 + 3*a^2*b*c*d^2*g*i*n^2 - a^3*d^3*g*i*n^2)*(log(b*x + a)*log((b*d*x +
a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) +
1/6*(2*B^2*b^3*d^3*g*i*x^3*log(e)^2 - ((2*g*i*n*log(e) - 3*g*i*log(e)^2)*b^
3*c*d^2 - (2*g*i*n*log(e) + 3*g*i*log(e)^2)*a*b^2*d^3)*B^2*x^2 - (3*a^2*b*c
```

```
*d^2*g*i*n^2 - a^3*d^3*g*i*n^2)*B^2*log(b*x + a)^2 - 2*(b^3*c^3*g*i*n^2 - 3
*a*b^2*c^2*d*g*i*n^2)*B^2*log(b*x + a)*log(d*x + c) + (b^3*c^3*g*i*n^2 - 3*
a*b^2*c^2*d*g*i*n^2)*B^2*log(d*x + c)^2 + 2*((g*i*n^2 - g*i*n*log(e))*b^3*c
^2*d - (2*g*i*n^2 - 3*g*i*log(e)^2)*a*b^2*c*d^2 + (g*i*n^2 + g*i*n*log(e))*
a^2*b*d^3)*B^2*x - 2*(a*b^2*c^2*d*g*i*n^2 + a^3*d^3*g*i*n*log(e) - (g*i*n^2
 + 3*g*i*n*log(e))*a^2*b*c*d^2)*B^2*log(b*x + a) + (2*B^2*b^3*d^3*g*i*x^3 +
 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^2*d^3*g*i)*B^2*x^2)*log((
b*x + a)^n)^2 + (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c
*d^2*g*i + a*b^2*d^3*g*i)*B^2*x^2)*log((d*x + c)^n)^2 + 2*(2*B^2*b^3*d^3*g*
i*x^3*log(e) - ((g*i*n - 3*g*i*log(e))*b^3*c*d^2 - (g*i*n + 3*g*i*log(e))*a
*b^2*d^3)*B^2*x^2 - (b^3*c^2*d*g*i*n - a^2*b*d^3*g*i*n - 6*a*b^2*c*d^2*g*i*
log(e))*B^2*x + (3*a^2*b*c*d^2*g*i*n - a^3*d^3*g*i*n)*B^2*log(b*x + a) + (b
^3*c^3*g*i*n - 3*a*b^2*c^2*d*g*i*n)*B^2*log(d*x + c))*log((b*x + a)^n) - 2*
(2*B^2*b^3*d^3*g*i*x^3*log(e) - ((g*i*n - 3*g*i*log(e))*b^3*c*d^2 - (g*i*n
+ 3*g*i*log(e))*a*b^2*d^3)*B^2*x^2 - (b^3*c^2*d*g*i*n - a^2*b*d^3*g*i*n - 6
*a*b^2*c*d^2*g*i*log(e))*B^2*x + (3*a^2*b*c*d^2*g*i*n - a^3*d^3*g*i*n)*B^2*
log(b*x + a) + (b^3*c^3*g*i*n - 3*a*b^2*c^2*d*g*i*n)*B^2*log(d*x + c) + (2*
B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^2*d^
3*g*i)*B^2*x^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bdgix^2 + A^2acgi + \left(A^2bc + A^2ad\right)gix + \left(B^2bdgix^2 + B^2acgi + \left(B^2bc + B^2ad\right)gix\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(A\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, alg
orithm="fricas")
```

```
[Out] integral(A^2*b*d*g*i*x^2 + A^2*a*c*g*i + (A^2*b*c + A^2*a*d)*g*i*x + (B^2*b
*d*g*i*x^2 + B^2*a*c*g*i + (B^2*b*c + B^2*a*d)*g*i*x)*log(e*((b*x + a)/(d*x
 + c))^n)^2 + 2*(A*B*b*d*g*i*x^2 + A*B*a*c*g*i + (A*B*b*c + A*B*a*d)*g*i*x)
*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)\left(dix + ci\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A
)^2, x)
```

3.162 $\int (ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=220

$$-\frac{B^2in^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2d}+\frac{Bin(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d}-\frac{Bin(a+bx)(bc-ad)\left(\ldots\right.}{b\ldots}$$

```
[Out] -((B*(b*c - a*d)*i*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/b^2)
 + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d) + (B^2*(b
*c - a*d)^2*i*n^2*Log[c + d*x])/(b^2*d) + (B*(b*c - a*d)^2*i*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*d) -
(B^2*(b*c - a*d)^2*i*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*d)
```

Rubi [A] time = 0.480723, antiderivative size = 307, normalized size of antiderivative = 1.4, number of steps used = 15, number of rules used = 12, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2in^2(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2d}-\frac{Bin(bc-ad)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d}+\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*i*n*x)/b) + (B^2*(b*c - a*d)^2*i*n^2*Log[a + b*x]^2)/(2*
b^2*d) - (B^2*(b*c - a*d)*i*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b^2
 - (B*(b*c - a*d)^2*i*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(b^2*d) + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d)
+ (B^2*(b*c - a*d)^2*i*n^2*Log[c + d*x])/(b^2*d) - (B^2*(b*c - a*d)^2*i*n^2
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*d) - (B^2*(b*c - a*d)^2*
i*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (162c+162dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(Bn)\int \frac{26244(bc-ad)(c+dx)\left(A+B\log\right.}{a+bx}}{162d}$$

$$= \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(162B(bc-ad)n)\int \frac{(c+dx)\left(A+B\right.}{}}{d}$$

$$= \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(162B(bc-ad)n)\int \left(\frac{d\left(A+B\log\right.}{}\right.}{}$$

$$= \frac{81(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(162B(bc-ad)n)\int \left(A+B\log\right.}{b}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B(bc-ad)^2n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{b^2d}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{16}{}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{16}{}$$

$$= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{16}{}$$

$$= -\frac{162AB(bc-ad)nx}{b} + \frac{81B^2(bc-ad)^2n^2\log^2(a+bx)}{b^2d} - \frac{162B^2(bc-}{}$$

$$= -\frac{162AB(bc-ad)nx}{b} + \frac{81B^2(bc-ad)^2n^2\log^2(a+bx)}{b^2d} - \frac{162B^2(bc-}{}$$

Mathematica [A] time = 0.211707, size = 216, normalized size = 0.98

$$\frac{i\left(\frac{Bn(bc-ad)\left(2Bn(ad-bc)\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)-2(bc-ad)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)-2\left(Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn(ad-bc)\log(c+dx)+A\right.\right.}{b^2}\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (i*((c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*(b*c - a*d)*n
*(B*(b*c - a*d)*n*Log[a + b*x]^2 - 2*(A*b*d*x + B*d*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + B*(-(b*c) + a*d)*n*Log[c + d*x]) - 2*(b*c - a*d)*Log[a
+ b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(b*(c + d*x))/(b*c -
 a*d)]) + 2*B*(-(b*c) + a*d)*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/b
^2))/(2*d)
```

Maple [F] time = 0.324, size = 0, normalized size = 0.

$$\int (dix+ci)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.5242, size = 1114, normalized size = 5.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] A*B*d*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*d*i*x^2 - A*B*
d*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
 2*A*B*c*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*c*i*x*log(e*(b*x
/(d*x + c) + a/(d*x + c))^n) + A^2*c*i*x - (a*c*d*i*n^2 - (i*n^2 - i*n*log(
e))*b*c^2)*B^2*log(d*x + c)/(b*d) - (b^2*c^2*i*n^2 - 2*a*b*c*d*i*n^2 + a^2*
d^2*i*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x
 + a*d)/(b*c - a*d)))*B^2/(b^2*d) + 1/2*(2*B^2*b^2*c^2*i*n^2*log(b*x + a)*l
og(d*x + c) - B^2*b^2*c^2*i*n^2*log(d*x + c)^2 + B^2*b^2*d^2*i*x^2*log(e)^2
 - (2*a*b*c*d*i*n^2 - a^2*d^2*i*n^2)*B^2*log(b*x + a)^2 + 2*(a*b*d^2*i*n*lo
g(e) - (i*n*log(e) - i*log(e)^2)*b^2*c*d)*B^2*x - 2*((i*n^2 - 2*i*n*log(e))
*a*b*c*d - (i*n^2 - i*n*log(e))*a^2*d^2)*B^2*log(b*x + a) + (B^2*b^2*d^2*i*
x^2 + 2*B^2*b^2*c*d*i*x)*log((b*x + a)^n)^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^
2*c*d*i*x)*log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*i*x^2*log(e) - B^2*b^2*c^2*i
*n*log(d*x + c) + (a*b*d^2*i*n - (i*n - 2*i*log(e))*b^2*c*d)*B^2*x + (2*a*b
*c*d*i*n - a^2*d^2*i*n)*B^2*log(b*x + a))*log((b*x + a)^n) - 2*(B^2*b^2*d^2
*i*x^2*log(e) - B^2*b^2*c^2*i*n*log(d*x + c) + (a*b*d^2*i*n - (i*n - 2*i*lo
g(e))*b^2*c*d)*B^2*x + (2*a*b*c*d*i*n - a^2*d^2*i*n)*B^2*log(b*x + a) + (B^
2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b
^2*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^{2}dix+A^{2}ci+\left(B^{2}dix+B^{2}ci\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2}+2\left(ABdix+ABci\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*d*i*x + A^2*c*i + (B^2*d*i*x + B^2*c*i)*log(e*((b*x + a)/(d*x
+ c))^n)^2 + 2*(A*B*d*i*x + A*B*c*i)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dix + ci) \left(B \log \left(e \left(\frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.163 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=306

$$\frac{2Bin(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g}+\frac{2B^2in^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2g}+\frac{2B^2in^2(bc-ad)}{}$$

```
[Out] (d*i*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g) + (2*B*(b*
c - a*d)*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c +
 d*x))])/(b^2*g) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*
Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g) + (2*B^2*(b*c - a*d)*i*n^2*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^2*g) + (2*B*(b*c - a*d)*i*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/
(b^2*g) + (2*B^2*(b*c - a*d)*i*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])
/(b^2*g)
```

Rubi [B] time = 2.87409, antiderivative size = 692, normalized size of antiderivative = 2.26, number of steps used = 36, number of rules used = 19, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.442, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABin(bc-ad)\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}+\frac{2B^2in(bc-ad)\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}+\frac{2aB^2din^2\text{PolyLog}}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x),
x]
```

```
[Out] -((A*B*(b*c - a*d)*i*n*Log[a + b*x]^2)/(b^2*g)) - (a*B^2*d*i*n^2*Log[a + b*
x]^2)/(b^2*g) - (B^2*(b*c - a*d)*i*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*
((a + b*x)/(c + d*x))^n]^2)/(b^2*g) - (B^2*(b*c - a*d)*i*Log[a + b*x]*Log[e
*((a + b*x)/(c + d*x))^n]^2)/(b^2*g) + (2*a*B*d*i*n*Log[a + b*x]*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(b^2*g) + (d*i*x*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(b*g) + ((b*c - a*d)*i*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^2)/(b^2*g) + (2*B^2*c*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/(b*g) - (2*B*c*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Lo
g[c + d*x])/(b*g) - (B^2*c*i*n^2*Log[c + d*x]^2)/(b*g) + (2*A*B*(b*c - a*d)
*i*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g) + (2*a*B^2*d*i*n^
2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g) + (2*A*B*(b*c - a*d)
*i*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*g) + (2*a*B^2*d*i*n^2*P
olyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*g) + (2*B^2*c*i*n^2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(b*g) + (2*B^2*(b*c - a*d)*i*n*Log[e*((a + b*
x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*g) + (2*B^
2*(b*c - a*d)*i*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
```

```
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(163c+163dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx=\int\left(\frac{163d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg}+\frac{163(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{bg(a+bx)}\right.$$

$$=\frac{(163d)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{bg}+\frac{(163(bc-ad))\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{a+bx}}{bg}$$

$$=\frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg}+\frac{163(bc-ad)\log(a+bx)\left(A+B\log\right.}{b^2g}$$

$$=\frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg}+\frac{163(bc-ad)\log(a+bx)\left(A+B\log\right.}{b^2g}$$

$$=\frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg}+\frac{163(bc-ad)\log(a+bx)\left(A+B\log\right.}{b^2g}$$

$$=\frac{163dx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg}+\frac{163(bc-ad)\log(a+bx)\left(A+B\log\right.}{b^2g}$$

$$=\frac{326aBdn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g}+\frac{163dx\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{bg}$$

$$=-\frac{163B^2(bc-ad)\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}+\frac{326aBdn\log(a+bx)\left(\right.}{b^2}$$

$$=-\frac{163B^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g}-\frac{163B^2(bc-ad)\log(a}{b}$$

$$=-\frac{163AB(bc-ad)n\log^2(a+bx)}{b^2g}-\frac{163B^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\right.}{b^2g}$$

$$=-\frac{163AB(bc-ad)n\log^2(a+bx)}{b^2g}-\frac{163aB^2dn^2\log^2(a+bx)}{b^2g}-\frac{163B^2(bc}{}$$

$$=-\frac{163AB(bc-ad)n\log^2(a+bx)}{b^2g}-\frac{163aB^2dn^2\log^2(a+bx)}{b^2g}-\frac{163B^2(bc}{}$$

Mathematica [B] time = 1.86057, size = 742, normalized size = 2.42

$$i\left(-3Bn\left(-2ad\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+2\left(\log\left(\frac{c}{d}+x\right)\left(-ad\log\left(\frac{d(a+bx)}{ad-bc}\right)+ad\log(a+bx)+bc\right)+(ad\log(a+bx)-bdx\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x),x]
```

```
[Out] (i*(3*b*d*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
d*x)])^2 + 3*(b*c - a*d)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
 - B*n*Log[(a + b*x)/(c + d*x)])^2 - 3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x
))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b +
 x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c + a*d*Log[a +
b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x) + a*d*Log[a + b*x
])*Log[(a + b*x)/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
 + 3*b*B*c*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
 d*x)])*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a/b + x] - Log[c/d + x] - Log
[(a + b*x)/(c + d*x)]) - 2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]
+ PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B^2*n^2*(Log[(a + b*x)/(c + d*x
)]*(-(a*d*Log[(a + b*x)/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c
+ b*d*x)] + 3*d*Log[(a + b*x)/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c
+ b*d*x)])) + 6*(b*c - a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a
 + b*x))/(b*(c + d*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) -
3*b*B^2*c*n^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2
 - 2*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*P
olyLog[3, (b*(c + d*x))/(d*(a + b*x))])))/(3*b^2*g)
```

Maple [F] time = 0.527, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^{2}di\left(\frac{x}{bg}-\frac{a\log(bx+a)}{b^{2}g}\right)+\frac{A^{2}ci\log\left(bgx+ag\right)}{bg}+\frac{\left(B^{2}bdix+(bci-adi)B^{2}\log(bx+a)\right)\log\left((dx+c)^{n}\right)^{2}}{b^{2}g}-\int-\frac{B^{2}b^{2}\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, alg
orithm="maxima")
```

```
[Out] A^2*d*i*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + A^2*c*i*log(b*g*x + a*g)/(b*g)
 + (B^2*b*d*i*x + (b*c*i - a*d*i)*B^2*log(b*x + a))*log((d*x + c)^n)^2/(b^2
```

```
*g) - integrate(-(B^2*b^2*c^2*i*log(e)^2 + 2*A*B*b^2*c^2*i*log(e) + (B^2*b^
2*d^2*i*log(e)^2 + 2*A*B*b^2*d^2*i*log(e))*x^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2
*b^2*c*d*i*x + B^2*b^2*c^2*i)*log((b*x + a)^n)^2 + 2*(B^2*b^2*c*d*i*log(e)^
2 + 2*A*B*b^2*c*d*i*log(e))*x + 2*(B^2*b^2*c^2*i*log(e) + A*B*b^2*c^2*i + (
B^2*b^2*d^2*i*log(e) + A*B*b^2*d^2*i)*x^2 + 2*(B^2*b^2*c*d*i*log(e) + A*B*b
^2*c*d*i)*x)*log((b*x + a)^n) - 2*(B^2*b^2*c^2*i*log(e) + A*B*b^2*c^2*i + (
(i*n + i*log(e))*B^2*b^2*d^2 + A*B*b^2*d^2*i)*x^2 + (2*A*B*b^2*c*d*i + (a*b
*d^2*i*n + 2*b^2*c*d*i*log(e))*B^2)*x + ((b^2*c*d*i*n - a*b*d^2*i*n)*B^2*x
+ (a*b*c*d*i*n - a^2*d^2*i*n)*B^2)*log(b*x + a) + (B^2*b^2*d^2*i*x^2 + 2*B^
2*b^2*c*d*i*x + B^2*b^2*c^2*i)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d*g
*x^2 + a*b^2*c*g + (b^3*c*g + a*b^2*d*g)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2dix + A^2ci + \left(B^2dix + B^2ci\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABdix + ABci\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{bgx + ag}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, alg
orithm="fricas")
```

```
[Out] integral((A^2*d*i*x + A^2*c*i + (B^2*d*i*x + B^2*c*i)*log(e*((b*x + a)/(d*x
 + c))^n)^2 + 2*(A*B*d*i*x + A*B*c*i)*log(e*((b*x + a)/(d*x + c))^n))/(b*g*
x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{bgx + ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a
*g), x)
```

3.164 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=261

$$\frac{2Bdin\,\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^2}+\frac{2B^2din^2\,\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2}-\frac{di\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.\cdots}{b^2g^2}$$

```
[Out] (-2*B^2*i*n^2*(c + d*x))/(b*g^2*(a + b*x)) - (2*B*i*n*(c + d*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(b*g^2*(a + b*x)) - (i*(c + d*x)*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])^2)/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B*
d*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a
 + b*x))])/(b^2*g^2) + (2*B^2*d*i*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)
)])/(b^2*g^2)
```

Rubi [B] time = 2.94537, antiderivative size = 766, normalized size of antiderivative = 2.93, number of steps used = 40, number of rules used = 20, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.465, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABdin\,\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2}+\frac{2B^2din\,\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g^2}-\frac{2B^2din^2\,\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)*i*n^2)/(b^2*g^2*(a + b*x)) - (2*B^2*d*i*n^2*Log[a + b*x
])/(b^2*g^2) - (A*B*d*i*n*Log[a + b*x]^2)/(b^2*g^2) + (B^2*d*i*n^2*Log[a +
b*x]^2)/(b^2*g^2) - (B^2*d*i*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*((a +
b*x)/(c + d*x))^n]^2)/(b^2*g^2) - (B^2*d*i*Log[a + b*x]*Log[e*((a + b*x)/(c
 + d*x))^n]^2)/(b^2*g^2) - (2*B*(b*c - a*d)*i*n*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(b^2*g^2*(a + b*x)) - (2*B*d*i*n*Log[a + b*x]*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(b^2*g^2) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2)/(b^2*g^2*(a + b*x)) + (d*i*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])^2)/(b^2*g^2) + (2*B^2*d*i*n^2*Log[c + d*x])/(b^2*g^2)
 - (2*B^2*d*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*g^2)
 + (2*B*d*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^2*g^2
) + (B^2*d*i*n^2*Log[c + d*x]^2)/(b^2*g^2) + (2*A*B*d*i*n*Log[a + b*x]*Log[
(b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) - (2*B^2*d*i*n^2*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)])/(b^2*g^2) + (2*A*B*d*i*n*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))])/(b^2*g^2) - (2*B^2*d*i*n^2*PolyLog[2, -((d*(a + b*x))/(b*c
 - a*d))])/(b^2*g^2) - (2*B^2*d*i*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
)/(b^2*g^2) + (2*B^2*d*i*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b
*c - a*d)/(d*(a + b*x))])/(b^2*g^2) + (2*B^2*d*i*n^2*PolyLog[3, 1 + (b*c -
a*d)/(d*(a + b*x))])/(b^2*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
```

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
```

```
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(164c+164dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx=\int\left(\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^2(a+bx)^2}+\frac{164d\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{bg^2(a+bx)}\right.$$

$$=\frac{(164d)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}dx}{bg^2}+\frac{(164(bc-ad))\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2}}{bg^2}$$

$$=-\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)}+\frac{164d\log(a+bx)\left(A+B\right.}{b^2g^2}$$

$$=-\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)}+\frac{164d\log(a+bx)\left(A+B\right.}{b^2g^2}$$

$$=-\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)}+\frac{164d\log(a+bx)\left(A+B\right.}{b^2g^2}$$

$$=-\frac{164(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2(a+bx)}+\frac{164d\log(a+bx)\left(A+B\right.}{b^2g^2}$$

$$=-\frac{328B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2g^2(a+bx)}-\frac{328Bdn\log(a+bx)\left(A\right.}{b^2g^2}$$

$$=-\frac{164B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g^2}-\frac{328B(bc-ad)n\left(A+B\log\right.}{b^2g^2(a+bx)}$$

$$=-\frac{164B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g^2}-\frac{164B^2d\log(a+bx)\log^2\left(\right.}{b^2g^2}$$

$$=-\frac{328B^2(bc-ad)n^2}{b^2g^2(a+bx)}-\frac{328B^2dn^2\log(a+bx)}{b^2g^2}-\frac{164ABdn\log^2(a+b}{b^2g^2}$$

$$=-\frac{328B^2(bc-ad)n^2}{b^2g^2(a+bx)}-\frac{328B^2dn^2\log(a+bx)}{b^2g^2}-\frac{164ABdn\log^2(a+b}{b^2g^2}$$

$$=-\frac{328B^2(bc-ad)n^2}{b^2g^2(a+bx)}-\frac{328B^2dn^2\log(a+bx)}{b^2g^2}-\frac{164ABdn\log^2(a+b}{b^2g^2}$$

Mathematica [B] time = 3.55228, size = 1556, normalized size = 5.96

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^2,x]
```

```
[Out] (i*((-3*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*
x)/(c + d*x)])^2)/(a + b*x) + 3*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + (6*b*B*c*n*(-A - B*Log[e*((a
+ b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(d*(a + b*x)*Log[c/d
 + x]) + d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c) + a*d)] + (b*c - a*d)*(1 + L
og[(a + b*x)/(c + d*x)])))/((b*c - a*d)*(a + b*x)) + (3*b*B^2*c*n^2*(-2*b*c
 + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*
x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - (b*c - a*d)*Log
[(a + b*x)/(c + d*x)]^2 + 2*d*(a + b*x)*Log[c + d*x] - 2*d*(a + b*x)*Log[(a
 + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(Log[a + b*
x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x)) + 3*B*d*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b +
 x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b
*c) + a*d)] + 2*Log[a + b*x]*((a*d)/(b*c - a*d) + Log[c/d + x] + Log[(a + b
*x)/(c + d*x)]) + 2*a*((a + b*x)^(-1) + Log[(a + b*x)/(c + d*x)]/(a + b*x)
+ (d*Log[c + d*x])/(-(b*c) + a*d)) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
]) + (B^2*d*n^2*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b
*x) + 6*a*d*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 - 6*
b*c*Log[c/d + x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a/b
+ x]*Log[a + b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]*Lo
g[a + b*x] - 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - (6*b*(b*c - a*d)*x*Log[(a + b*x)/(c + d*x)])/(a + b*x) + 6*b*c*Log[a
 + b*x]*Log[(a + b*x)/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(a + b*x)/(c + d*
x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2 + 3*b*d*x*Log[(a + b*x)/(c + d*x)]^2
 - (3*b^2*x*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2)/(a + b*x) - 3*b*c*Log[(-(
b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - a*d*Log[(a + b*x)/(
c + d*x)]^3 + 6*b*c*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
 - 6*a*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d*Lo
g[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b*c - a*d + a*
d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*(b*
c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 6*b*c*Log[(a + b*x)/(c + d
*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*a*d*PolyLog[3, (d*(a + b*x
))/(b*(c + d*x))] + 6*b*c*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]))/(b*c -
a*d)))/(3*b^2*g^2)
```

Maple [F] time = 0.554, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{\left(bgx + ag\right)^{2}} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, a
lgorithm="maxima")
```

```
[Out] -2*A*B*c*i*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2
) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + A^2*d*i*(a/(b^3*g^2*x + a*b^2*g
^2) + log(b*x + a)/(b^2*g^2)) - 2*A*B*c*i*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n)/(b^2*g^2*x + a*b*g^2) - A^2*c*i/(b^2*g^2*x + a*b*g^2) - ((b*c*i - a*d
*i)*B^2 - (B^2*b*d*i*x + B^2*a*d*i)*log(b*x + a))*log((d*x + c)^n)^2/(b^3*g
^2*x + a*b^2*g^2) - integrate(-(B^2*b^2*c^2*i*log(e)^2 + (B^2*b^2*d^2*i*log
(e)^2 + 2*A*B*b^2*d^2*i*log(e))*x^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*
x + B^2*b^2*c^2*i)*log((b*x + a)^n)^2 + 2*(B^2*b^2*c*d*i*log(e)^2 + A*B*b^2
*c*d*i*log(e))*x + 2*(B^2*b^2*c^2*i*log(e) + (B^2*b^2*d^2*i*log(e) + A*B*b^
2*d^2*i)*x^2 + (2*B^2*b^2*c*d*i*log(e) + A*B*b^2*c*d*i)*x)*log((b*x + a)^n)
 + 2*((a*b*c*d*i*n - a^2*d^2*i*n - b^2*c^2*i*log(e))*B^2 - (B^2*b^2*d^2*i*l
og(e) + A*B*b^2*d^2*i)*x^2 - (A*B*b^2*c*d*i + (a*b*d^2*i*n - (i*n - 2*i*log
(e))*b^2*c*d)*B^2)*x - (B^2*b^2*d^2*i*n*x^2 + 2*B^2*a*b*d^2*i*n*x + B^2*a^2
*d^2*i*n)*log(b*x + a) - (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + B^2*b^2*c
^2*i)*log((b*x + a)^n))*log((d*x + c)^n))/(b^4*d*g^2*x^3 + a^2*b^2*c*g^2 +
(b^4*c*g^2 + 2*a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2 + a^2*b^2*d*g^2)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2dix + A^2ci + \left(B^2dix + B^2ci\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABdix + ABci\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((A^2*d*i*x + A^2*c*i + (B^2*d*i*x + B^2*c*i)*log(e*((b*x + a)/(d*x
 + c))^n)^2 + 2*(A*B*d*i*x + A*B*c*i)*log(e*((b*x + a)/(d*x + c))^n))/(b^2*
g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{\left(bgx + ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a
*g)^2, x)
```

3.165 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=151

$$-\frac{i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)}-\frac{Bin(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3(a+bx)^2(bc-ad)}-\frac{B^2in^2(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

```
[Out] -(B^2*i*n^2*(c + d*x)^2)/(4*(b*c - a*d)*g^3*(a + b*x)^2) - (B*i*n*(c + d*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*g^3*(a + b*x)^2)
- (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)*g
^3*(a + b*x)^2)
```

Rubi [C] time = 2.05542, antiderivative size = 691, normalized size of antiderivative = 4.58, number of steps used = 54, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2d^2in^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g^3(bc-ad)}-\frac{B^2d^2in^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{b^2g^3(bc-ad)}-\frac{Bd^2in\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2g^3(bc-ad)}+\frac{Bd^2in}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
3,x]
```

```
[Out] -(B^2*(b*c - a*d)*i*n^2)/(4*b^2*g^3*(a + b*x)^2) - (B^2*d*i*n^2)/(2*b^2*g^3
*(a + b*x)) - (B^2*d^2*i*n^2*Log[a + b*x])/(2*b^2*(b*c - a*d)*g^3) + (B^2*d
^2*i*n^2*Log[a + b*x]^2)/(2*b^2*(b*c - a*d)*g^3) - (B*(b*c - a*d)*i*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^3*(a + b*x)^2) - (B*d*i*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^3*(a + b*x)) - (B*d^2*i*n*Log[a +
 b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*(b*c - a*d)*g^3) - ((b*c
 - a*d)*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^3*(a + b*x)^2)
 - (d*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^3*(a + b*x)) + (B^
2*d^2*i*n^2*Log[c + d*x])/(2*b^2*(b*c - a*d)*g^3) - (B^2*d^2*i*n^2*Log[-((d
*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*(b*c - a*d)*g^3) + (B*d^2*i*n*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^2*(b*c - a*d)*g^3)
+ (B^2*d^2*i*n^2*Log[c + d*x]^2)/(2*b^2*(b*c - a*d)*g^3) - (B^2*d^2*i*n^2*L
og[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*(b*c - a*d)*g^3) - (B^2*d^
2*i*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*(b*c - a*d)*g^3) - (
B^2*d^2*i*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*(b*c - a*d)*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
```

```
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(165c+165dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}dx = \int \left(\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^3(a+bx)^3}+\frac{165d\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{bg^3(a+bx)^2}\right.$$

$$= \frac{(165d)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2}dx}{bg^3}+\frac{(165(bc-ad))\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^3}}{bg^3}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{165d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{165d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{165d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{165(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2b^2g^3(a+bx)^2}-\frac{165d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{165B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^3(a+bx)^2}-\frac{165Bdn\left(A+B\log\left(e\left(\right.\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{165B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^3(a+bx)^2}-\frac{165Bdn\left(A+B\log\left(e\left(\right.\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{165B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b^2g^3(a+bx)^2}-\frac{165Bdn\left(A+B\log\left(e\left(\right.\right.\right.}{b^2g^3(a+bx)}$$

$$= -\frac{165B^2(bc-ad)n^2}{4b^2g^3(a+bx)^2}-\frac{165B^2dn^2}{2b^2g^3(a+bx)}-\frac{165B^2d^2n^2\log(a+bx)}{2b^2(bc-ad)g^3}-\frac{16}{}$$

$$= -\frac{165B^2(bc-ad)n^2}{4b^2g^3(a+bx)^2}-\frac{165B^2dn^2}{2b^2g^3(a+bx)}-\frac{165B^2d^2n^2\log(a+bx)}{2b^2(bc-ad)g^3}+\frac{16}{}$$

$$= -\frac{165B^2(bc-ad)n^2}{4b^2g^3(a+bx)^2}-\frac{165B^2dn^2}{2b^2g^3(a+bx)}-\frac{165B^2d^2n^2\log(a+bx)}{2b^2(bc-ad)g^3}+\frac{16}{}$$

Mathematica [C] time = 0.927759, size = 801, normalized size = 5.3

$$-\frac{i\left(2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2-4d(ad-bc)(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2+4Bdn(a+bx)\left(2(bc-ad)\left(A\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^3,x]
```

```
[Out] -(i*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 4*d*(-(b*c)
 + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 4*B*d*n*(a + b
*x)*(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d*(a + b*x)*L
og[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(a + b*x)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*B*n*(b*c - a*d + d*(a + b*x
)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*n*(a + b*x)*(Log[a + b*x]*
(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*
x))/(-(b*c) + a*d)]) + B*d*n*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)
] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
+ B*n*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d*(-(b*c)
 + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b*x)^
2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*x)^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*B*d*n*(a + b*x)*(b*c
 - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*n*((b*c -
 a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2
*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*(Log[a + b*x]*(Log[a
 + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)
] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))
)/(4*b^2*(b*c - a*d)*g^3*(a + b*x)^2)
```

Maple [F] time = 0.527, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^3} \left(A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

Maxima [B] time = 1.75431, size = 2723, normalized size = 18.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] -1/2*A*B*d*i*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d
)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) +
2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
*g^3)) + 1/2*A*B*c*i*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2
+ 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*
x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3
```

```
*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*(2*b*x + a)*B^2*d*i*log(e*(b*x/
(d*x + c) + a/(d*x + c))^n)^2/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) +
 1/4*(2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c
- a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*
c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^
2*c*d + a^2*b*d^2)*g^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (b^2*c^2
- 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x +
 a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d
 - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3
*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2
*d^2)*log(b*x + a))*log(d*x + c))*n^2/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3
+ a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2
*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2*c*i - 1/4*(2
*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 +
2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d -
 a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c
*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3))*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n) + (7*a*b^2*c^2 - 8*a^2*b*c*d + a^3*d^2 -
2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a
^2*b*d^2)*x)*log(b*x + a)^2 - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2
*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(d*x + c)^2 + 2*(4*b^3*c^2 -
5*a*b^2*c*d + a^2*b*d^2)*x + 2*(4*a^2*b*c*d - a^3*d^2 + (4*b^3*c*d - a*b^2*
d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a) - 2*(4*a^2*b*c*d - a
^3*d^2 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x - 2*(2
*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b
*d^2)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^2*b^4*c^2*g^3 - 2*a^3*b^3*c*d*g
^3 + a^4*b^2*d^2*g^3 + (b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 + a^2*b^4*d^2*g^3)*x^
2 + 2*(a*b^5*c^2*g^3 - 2*a^2*b^4*c*d*g^3 + a^3*b^3*d^2*g^3)*x))*B^2*d*i - (
2*b*x + a)*A*B*d*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^3*x^2 + 2*
a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*B^2*c*i*log(e*(b*x/(d*x + c) + a/(d*x + c)
)^n)^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*(2*b*x + a)*A^2*d*i/
(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - A*B*c*i*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2*c*i/(
b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [B] time = 0.533099, size = 1214, normalized size = 8.04

$$-\frac{\left(B^2b^2c^2 - B^2a^2d^2\right)in^2 + 2\left(ABb^2c^2 - ABa^2d^2\right)in + 2\left(2\left(B^2b^2cd - B^2abd^2\right)ix + \left(B^2b^2c^2 - B^2a^2d^2\right)i\right)\log\left(e\right)^2 + 2\left(B^2b^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/4*((B^2*b^2*c^2 - B^2*a^2*d^2)*i*n^2 + 2*(A*B*b^2*c^2 - A*B*a^2*d^2)*i*n
 + 2*(2*(B^2*b^2*c*d - B^2*a*b*d^2)*i*x + (B^2*b^2*c^2 - B^2*a^2*d^2)*i)*lo
g(e)^2 + 2*(B^2*b^2*d^2*i*n^2*x^2 + 2*B^2*b^2*c*d*i*n^2*x + B^2*b^2*c^2*i*n
^2)*log((b*x + a)/(d*x + c))^2 + 2*(A^2*b^2*c^2 - A^2*a^2*d^2)*i + 2*((B^2*
b^2*c*d - B^2*a*b*d^2)*i*n^2 + 2*(A*B*b^2*c*d - A*B*a*b*d^2)*i*n + 2*(A^2*b
^2*c*d - A^2*a*b*d^2)*i)*x + 2*((B^2*b^2*c^2 - B^2*a^2*d^2)*i*n + 2*(A*B*b^
2*c^2 - A*B*a^2*d^2)*i + 2*((B^2*b^2*c*d - B^2*a*b*d^2)*i*n + 2*(A*B*b^2*c*
d - A*B*a*b*d^2)*i)*x + 2*(B^2*b^2*d^2*i*n*x^2 + 2*B^2*b^2*c*d*i*n*x + B^2*
b^2*c^2*i*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*(B^2*b^2*c^2*i*n^2 + 2*A*
B*b^2*c^2*i*n + (B^2*b^2*d^2*i*n^2 + 2*A*B*b^2*d^2*i*n)*x^2 + 2*(B^2*b^2*c*
d*i*n^2 + 2*A*B*b^2*c*d*i*n)*x)*log((b*x + a)/(d*x + c)))/((b^5*c - a*b^4*d
```

```
)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a
*g)^3, x)
```

3.166 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=307

$$-\frac{bi(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^2}-\frac{2bBin(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^2}+\frac{di(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right.}{2g^4(a+bx)^2(bc-ad)^2}$$

```
[Out] (B^2*d*i*n^2*(c + d*x)^2)/(4*(b*c - a*d)^2*g^4*(a + b*x)^2) - (2*b*B^2*i*n^
2*(c + d*x)^3)/(27*(b*c - a*d)^2*g^4*(a + b*x)^3) + (B*d*i*n*(c + d*x)^2*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (
2*b*B*i*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d
)^2*g^4*(a + b*x)^3) + (d*i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(2*(b*c - a*d)^2*g^4*(a + b*x)^2) - (b*i*(c + d*x)^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Rubi [C] time = 2.43164, antiderivative size = 800, normalized size of antiderivative = 2.61, number of steps used = 62, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2in^2\log^2(a+bx)d^3}{6b^2(bc-ad)^2g^4}-\frac{B^2in^2\log^2(c+dx)d^3}{6b^2(bc-ad)^2g^4}+\frac{5B^2in^2\log(a+bx)d^3}{18b^2(bc-ad)^2g^4}+\frac{Bin\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^3}{3b^2(bc-ad)^2g^4}-$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
4,x]
```

```
[Out] (-2*B^2*(b*c - a*d)*i*n^2)/(27*b^2*g^4*(a + b*x)^3) + (B^2*d*i*n^2)/(36*b^2
*g^4*(a + b*x)^2) + (5*B^2*d^2*i*n^2)/(18*b^2*(b*c - a*d)*g^4*(a + b*x)) +
(5*B^2*d^3*i*n^2*Log[a + b*x])/(18*b^2*(b*c - a*d)^2*g^4) - (B^2*d^3*i*n^2*
Log[a + b*x]^2)/(6*b^2*(b*c - a*d)^2*g^4) - (2*B*(b*c - a*d)*i*n*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(9*b^2*g^4*(a + b*x)^3) - (B*d*i*n*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(6*b^2*g^4*(a + b*x)^2) + (B*d^2*i*n*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*(b*c - a*d)*g^4*(a + b*x)) + (B*d^3*
i*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*(b*c - a*d)
^2*g^4) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b^2*g
^4*(a + b*x)^3) - (d*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^4
*(a + b*x)^2) - (5*B^2*d^3*i*n^2*Log[c + d*x])/(18*b^2*(b*c - a*d)^2*g^4) +
 (B^2*d^3*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b^2*(b*c
 - a*d)^2*g^4) - (B*d^3*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x])/(3*b^2*(b*c - a*d)^2*g^4) - (B^2*d^3*i*n^2*Log[c + d*x]^2)/(6*b^2*(b*
c - a*d)^2*g^4) + (B^2*d^3*i*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)
])/(3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*n^2*PolyLog[2, -((d*(a + b*x))/(b
*c - a*d))])/(3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*n^2*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])/(3*b^2*(b*c - a*d)^2*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(166c+166dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx = \int \left(\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^4(a+bx)^4}+\frac{166d\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{bg^4(a+bx)^3}\right.$$

$$=\frac{(166d)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^3}dx}{bg^4}+\frac{(166(bc-ad))\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^4}}{bg^4}$$

$$=-\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{83d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2g^4(a+bx)^2}$$

$$=-\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{83d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2g^4(a+bx)^2}$$

$$=-\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{83d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2g^4(a+bx)^2}$$

$$=-\frac{166(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^2g^4(a+bx)^3}-\frac{83d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2g^4(a+bx)^2}$$

$$=-\frac{332B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^2g^4(a+bx)^3}-\frac{83Bdn\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3b^2g^4(a+bx)^2}$$

$$=-\frac{332B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^2g^4(a+bx)^3}-\frac{83Bdn\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3b^2g^4(a+bx)^2}$$

$$=-\frac{332B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^2g^4(a+bx)^3}-\frac{83Bdn\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3b^2g^4(a+bx)^2}$$

$$=-\frac{332B^2(bc-ad)n^2}{27b^2g^4(a+bx)^3}+\frac{83B^2dn^2}{18b^2g^4(a+bx)^2}+\frac{415B^2d^2n^2}{9b^2(bc-ad)g^4(a+bx)}+$$

$$=-\frac{332B^2(bc-ad)n^2}{27b^2g^4(a+bx)^3}+\frac{83B^2dn^2}{18b^2g^4(a+bx)^2}+\frac{415B^2d^2n^2}{9b^2(bc-ad)g^4(a+bx)}+$$

$$=-\frac{332B^2(bc-ad)n^2}{27b^2g^4(a+bx)^3}+\frac{83B^2dn^2}{18b^2g^4(a+bx)^2}+\frac{415B^2d^2n^2}{9b^2(bc-ad)g^4(a+bx)}+$$

Mathematica [C] time = 1.19571, size = 1079, normalized size = 3.51

$$-\frac{i\left(36\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(bc-ad)^3+54d(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(bc-ad)^2+27Bdn(a+bx)\left(2\left(A+B\log\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^4,x]
```

```
[Out] -(i*(36*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 54*d*(b*c
- a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 27*B*d*n*(a +
 b*x)*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d*(-(b*c)
 + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b*x)^
2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*x)^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*B*d*n*(a + b*x)*(b*c
 - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*n*((b*c -
 a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2
*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*(Log[a + b*x]*(Log[a
 + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)
] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
+ 2*B*n*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 18*d*(b*
c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*(b*c -
 a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a + b*x)
^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a + b*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 36*B*d^2*n*(a + b*x)
^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*
d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*
x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*n*(2*(b*c - a*d)^
3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a
+ b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*n*(a + b
*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2*Log[(
d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)]))))/(108*b^2*(b*c - a*d)^2*g^4*(a + b*x)^3)
```

Maple [F] time = 0.54, size = 0, normalized size = 0.

$$\int \frac{dix+ci}{\left(bgx+ag\right)^4}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

Maxima [B] time = 2.21635, size = 4471, normalized size = 14.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, a
lgorithm="maxima")

[Out] -1/9*A*B*c*i*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^
2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a
*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^
3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4)
 + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d
^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
 a^3*b*d^3)*g^4)) - 1/18*A*B*d*i*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2
 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^
2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2
*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*
d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^
2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b
^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d
 + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/6*(3*b*x + a)*B^2*d*i*log(e*(b*
x/(d*x + c) + a/(d*x + c))^n)^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*
g^4*x + a^3*b^2*g^4) - 1/54*(6*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d +
11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d
^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*
b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d
 + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b
^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d +
 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
+ (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^
2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^
3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x +
 a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*
x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x +
a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6
*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*lo
g(d*x + c))*n^2/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^
4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4
- a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4
*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^
4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*c*i - 1/108*(6*n*((5*a*b
^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^
3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^
2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b
^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d
+ a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^
4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d
*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4))*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (19*a*b^3*c^3 - 189*a^2*b^2*c^2*d +
189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a*b^3*c*d^2 + 5*a^2*b^2
*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3
*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log
(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 +
 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*l
og(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*a^2*b^2*c*d^2 - 19*a^3
*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^
3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*
d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*
b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d^2
 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*
x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)
*x)*log(b*x + a))*log(d*x + c))*n^2/(a^3*b^5*c^3*g^4 - 3*a^4*b^4*c^2*d*g^4
+ 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 - 3*a*b^7*c^2*d*g^4

```
+ 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b^7*c^3*g^4 - 3*a^2*b^6
*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x^2 + 3*(a^2*b^6*c^3*g^
4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b^3*d^3*g^4)*x))*B^2*d*
i - 1/3*(3*b*x + a)*A*B*d*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^4
*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*B^2*c*i*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*
b^2*g^4*x + a^3*b*g^4) - 1/6*(3*b*x + a)*A^2*d*i/(b^5*g^4*x^3 + 3*a*b^4*g^4
*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 2/3*A*B*c*i*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^
4) - 1/3*A^2*c*i/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g
^4)
```

Fricas [B] time = 0.611944, size = 2388, normalized size = 7.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, a
lgorithm="fricas")
```

```
[Out] -1/108*((8*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 19*B^2*a^3*d^3)*i*n^2 + 6*(4*
A*B*b^3*c^3 - 9*A*B*a*b^2*c^2*d + 5*A*B*a^3*d^3)*i*n - 6*(5*(B^2*b^3*c*d^2
- B^2*a*b^2*d^3)*i*n^2 + 6*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*i*n)*x^2 + 18*(3
*(B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*i*x + (2*B^2*b^3*c^3 -
 3*B^2*a*b^2*c^2*d + B^2*a^3*d^3)*i)*log(e)^2 - 18*(B^2*b^3*d^3*i*n^2*x^3 +
 3*B^2*a*b^2*d^3*i*n^2*x^2 - 3*(B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2)*i*n^2*x
- (2*B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d)*i*n^2)*log((b*x + a)/(d*x + c))^2 + 1
8*(2*A^2*b^3*c^3 - 3*A^2*a*b^2*c^2*d + A^2*a^3*d^3)*i - 3*((B^2*b^3*c^2*d +
 18*B^2*a*b^2*c*d^2 - 19*B^2*a^2*b*d^3)*i*n^2 - 6*(A*B*b^3*c^2*d - 6*A*B*a*
b^2*c*d^2 + 5*A*B*a^2*b*d^3)*i*n - 18*(A^2*b^3*c^2*d - 2*A^2*a*b^2*c*d^2 +
A^2*a^2*b*d^3)*i)*x - 6*(6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*i*n*x^2 - (4*B^2
*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 5*B^2*a^3*d^3)*i*n - 6*(2*A*B*b^3*c^3 - 3*A*
B*a*b^2*c^2*d + A*B*a^3*d^3)*i - 3*((B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 5*
B^2*a^2*b*d^3)*i*n + 6*(A*B*b^3*c^2*d - 2*A*B*a*b^2*c*d^2 + A*B*a^2*b*d^3)*
i)*x + 6*(B^2*b^3*d^3*i*n*x^3 + 3*B^2*a*b^2*d^3*i*n*x^2 - 3*(B^2*b^3*c^2*d
- 2*B^2*a*b^2*c*d^2)*i*n*x - (2*B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d)*i*n)*log((
b*x + a)/(d*x + c)))*log(e) + 6*((4*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d)*i*n^2
- (5*B^2*b^3*d^3*i*n^2 + 6*A*B*b^3*d^3*i*n)*x^3 + 6*(2*A*B*b^3*c^3 - 3*A*B*
a*b^2*c^2*d)*i*n - 3*(6*A*B*a*b^2*d^3*i*n + (2*B^2*b^3*c*d^2 + 3*B^2*a*b^2*
d^3)*i*n^2)*x^2 + 3*((B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2)*i*n^2 + 6*(A*B*b^3
*c^2*d - 2*A*B*a*b^2*c*d^2)*i*n)*x)*log((b*x + a)/(d*x + c)))/((b^7*c^2 - 2
*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*
d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b
^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A\right)^{2}}{\left(bgx + ag\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a
*g)^4, x)
```

3.167 $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=475

$$-\frac{b^2i(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^3}-\frac{b^2Bin(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^3}-\frac{d^2i(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^5(a+bx)^2(bc-ad)^3}$$

```
[Out] -(B^2*d^2*i*n^2*(c + d*x)^2)/(4*(b*c - a*d)^3*g^5*(a + b*x)^2) + (4*b*B^2*d
*i*n^2*(c + d*x)^3)/(27*(b*c - a*d)^3*g^5*(a + b*x)^3) - (b^2*B^2*i*n^2*(c
+ d*x)^4)/(32*(b*c - a*d)^3*g^5*(a + b*x)^4) - (B*d^2*i*n*(c + d*x)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (4*b
*B*d*i*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)
^3*g^5*(a + b*x)^3) - (b^2*B*i*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(8*(b*c - a*d)^3*g^5*(a + b*x)^4) - (d^2*i*(c + d*x)^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g^5*(a + b*x)^2) + (2*b*d*
i*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^3*g^
5*(a + b*x)^3) - (b^2*i*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/(4*(b*c - a*d)^3*g^5*(a + b*x)^4)
```

Rubi [C] time = 2.87453, antiderivative size = 892, normalized size of antiderivative = 1.88, number of steps used = 70, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2in^2\log^2(a+bx)d^4}{12b^2(bc-ad)^3g^5}+\frac{B^2in^2\log^2(c+dx)d^4}{12b^2(bc-ad)^3g^5}-\frac{13B^2in^2\log(a+bx)d^4}{72b^2(bc-ad)^3g^5}-\frac{Bin\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^4}{6b^2(bc-ad)^3g^5}+13$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^
5,x]
```

```
[Out] -(B^2*(b*c - a*d)*i*n^2)/(32*b^2*g^5*(a + b*x)^4) + (5*B^2*d*i*n^2)/(216*b^
2*g^5*(a + b*x)^3) + (B^2*d^2*i*n^2)/(144*b^2*(b*c - a*d)*g^5*(a + b*x)^2)
- (13*B^2*d^3*i*n^2)/(72*b^2*(b*c - a*d)^2*g^5*(a + b*x)) - (13*B^2*d^4*i*n
^2*Log[a + b*x])/(72*b^2*(b*c - a*d)^3*g^5) + (B^2*d^4*i*n^2*Log[a + b*x]^2
)/(12*b^2*(b*c - a*d)^3*g^5) - (B*(b*c - a*d)*i*n*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(8*b^2*g^5*(a + b*x)^4) - (B*d*i*n*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(18*b^2*g^5*(a + b*x)^3) + (B*d^2*i*n*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(12*b^2*(b*c - a*d)*g^5*(a + b*x)^2) - (B*d^3*i*n*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^2*(b*c - a*d)^2*g^5*(a + b*x)) - (B*d
^4*i*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^2*(b*c - a
*d)^3*g^5) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b^
2*g^5*(a + b*x)^4) - (d*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b^2*
g^5*(a + b*x)^3) + (13*B^2*d^4*i*n^2*Log[c + d*x])/(72*b^2*(b*c - a*d)^3*g^
5) - (B^2*d^4*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(6*b^2*
(b*c - a*d)^3*g^5) + (B*d^4*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[
c + d*x])/(6*b^2*(b*c - a*d)^3*g^5) + (B^2*d^4*i*n^2*Log[c + d*x]^2)/(12*b^
2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c -
 a*d)])/(6*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*n^2*PolyLog[2, -((d*(a + b*x
))/(b*c - a*d))])/(6*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*n^2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/(6*b^2*(b*c - a*d)^3*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(167c+167dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx = \int \left(\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^5(a+bx)^5} + \frac{167d\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{bg^5(a+bx)^4}\right.$$

$$= \frac{(167d)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^4}dx}{bg^5} + \frac{(167(bc-ad))\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^5}}{bg^5}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{167d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{3b^2g^5(a+bx)^3}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{167d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{3b^2g^5(a+bx)^3}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{167d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{3b^2g^5(a+bx)^3}$$

$$= -\frac{167(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4b^2g^5(a+bx)^4} - \frac{167d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{3b^2g^5(a+bx)^3}$$

$$= -\frac{167B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8b^2g^5(a+bx)^4} - \frac{167Bdn\left(A+B\log\left(e\left(\right.\right.\right.}{18b^2g^5(a+bx)^3}$$

$$= -\frac{167B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8b^2g^5(a+bx)^4} - \frac{167Bdn\left(A+B\log\left(e\left(\right.\right.\right.}{18b^2g^5(a+bx)^3}$$

$$= -\frac{167B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8b^2g^5(a+bx)^4} - \frac{167Bdn\left(A+B\log\left(e\left(\right.\right.\right.}{18b^2g^5(a+bx)^3}$$

$$= -\frac{167B^2(bc-ad)n^2}{32b^2g^5(a+bx)^4} + \frac{835B^2dn^2}{216b^2g^5(a+bx)^3} + \frac{167B^2d^2n^2}{144b^2(bc-ad)g^5(a+bx)}$$

$$= -\frac{167B^2(bc-ad)n^2}{32b^2g^5(a+bx)^4} + \frac{835B^2dn^2}{216b^2g^5(a+bx)^3} + \frac{167B^2d^2n^2}{144b^2(bc-ad)g^5(a+bx)}$$

$$= -\frac{167B^2(bc-ad)n^2}{32b^2g^5(a+bx)^4} + \frac{835B^2dn^2}{216b^2g^5(a+bx)^3} + \frac{167B^2d^2n^2}{144b^2(bc-ad)g^5(a+bx)}$$

Mathematica [C] time = 1.46439, size = 1392, normalized size = 2.93

$$-\frac{i\left(216\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(bc-ad)^4 - 288d(ad-bc)^3(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + 16Bdn(a+bx)\left(12\left(A\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b
*g*x)^5,x]
```

```
[Out] -(i*(216*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 288*d*(-(
b*c) + a*d)^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 16*B*d*n
*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 18*d*
(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*(b*
c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a + b
*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a + b*x
)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 36*B*d^2*n*(a + b
*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9
*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a +
 b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*n*(2*(b*c - a*
d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*
(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*n*(a
+ b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)])) + 3*B*n*(36*(b*c - a*d)^4*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a +
b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n*(a + b*x)^2*((b*c - a*d)^2 +
2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a +
b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)
^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*
x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*(3*(b*c - a*d)^4 + 4*d*(-(b*c)
 + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*
d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*Log[c
 + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B
*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Lo
g[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(864*b^2*(b*c - a*
d)^3*g^5*(a + b*x)^4)
```

Maple [F] time = 0.532, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^5} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

Maxima [B] time = 3.05988, size = 6531, normalized size = 13.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, a
lgorithm="maxima")
```

```
[Out] 1/24*A*B*c*i*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d
^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*
c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*
b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b
^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*
b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6
*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*
d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d
^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*
a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/72
*A*B*d*i*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 +
 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2
*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b
*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4
 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3
+ 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2
 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x
+ (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12
*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2
*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x
 + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4
*b^2*d^4)*g^5)) - 1/12*(4*b*x + a)*B^2*d*i*log(e*(b*x/(d*x + c) + a/(d*x +
c))^n)^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5
*x + a^4*b^2*g^5) + 1/288*(12*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2
*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3
*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2
*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*
b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4
*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^
5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b
^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d
+ 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x +
c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*
d^4)*g^5))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (9*b^4*c^4 - 64*a*b^3*c
^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3
 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*
x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
 + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*
d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b
^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*
b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 1
2*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4
*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4
*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))*log(d*x + c))*n^2/(a^4*b^5*c^4*g^5 -
4*a^5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d
^4*g^5 + (b^9*c^4*g^5 - 4*a*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b
^6*c*d^3*g^5 + a^4*b^5*d^4*g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^
5 + 6*a^3*b^6*c^2*d^2*g^5 - 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*
(a^2*b^7*c^4*g^5 - 4*a^3*b^6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*
c*d^3*g^5 + a^6*b^3*d^4*g^5)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5
 + 6*a^5*b^4*c^2*d^2*g^5 - 4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c
*i - 1/864*(12*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4
*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 +
 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13
*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g
^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^
5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g
^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*
g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5
```

```
) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b
^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*l
og(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3
 + a^4*b^2*d^4)*g^5))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (37*a*b^4*c^
4 - 304*a^2*b^3*c^3*d + 1512*a^3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d
^4 + 12*(88*b^5*c^2*d^2 - 101*a*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5
*c^3*d - 609*a*b^4*c^2*d^2 + 648*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*(
4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3
- a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c
*d^3 - a^4*b*d^4)*x)*log(b*x + a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*
c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3
*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(d*x + c)
^2 + 4*(16*b^5*c^4 - 163*a*b^4*c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*
c*d^3 + 115*a^4*b*d^4)*x + 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3
- 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b
^3*c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x)*log
(b*x + a) - 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)
*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a
^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3
 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4
)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*
d^4)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*
g^5 + 6*a^6*b^4*c^2*d^2*g^5 - 4*a^7*b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10
*c^4*g^5 - 4*a*b^9*c^3*d*g^5 + 6*a^2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5
+ a^4*b^6*d^4*g^5)*x^4 + 4*(a*b^9*c^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7
*c^2*d^2*g^5 - 4*a^4*b^6*c*d^3*g^5 + a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*
g^5 - 4*a^3*b^7*c^3*d*g^5 + 6*a^4*b^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a
^6*b^4*d^4*g^5)*x^2 + 4*(a^3*b^7*c^4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*
c^2*d^2*g^5 - 4*a^6*b^4*c*d^3*g^5 + a^7*b^3*d^4*g^5)*x))*B^2*d*i - 1/6*(4*b
*x + a)*A*B*d*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^6*g^5*x^4 + 4*a*b
^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/4*B^2*c
*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/12*(4*b*x + a)*A^2*d
*i/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a
^4*b^2*g^5) - 1/2*A*B*c*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^5*x
^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1
/4*A^2*c*i/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g
^5*x + a^4*b*g^5)
```

Fricas [B] time = 0.697496, size = 3800, normalized size = 8.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, a
lgorithm="fricas")
```

```
[Out] -1/864*((27*B^2*b^4*c^4 - 128*B^2*a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 1
15*B^2*a^4*d^4)*i*n^2 + 12*(13*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*i*n^2 + 12*(
A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*i*n)*x^3 + 12*(9*A*B*b^4*c^4 - 32*A*B*a*b^3*
c^3*d + 36*A*B*a^2*b^2*c^2*d^2 - 13*A*B*a^4*d^4)*i*n - 6*((B^2*b^4*c^2*d^2
- 80*B^2*a*b^3*c*d^3 + 79*B^2*a^2*b^2*d^4)*i*n^2 + 12*(A*B*b^4*c^2*d^2 - 8*
A*B*a*b^3*c*d^3 + 7*A*B*a^2*b^2*d^4)*i*n)*x^2 + 72*(4*(B^2*b^4*c^3*d - 3*B^
2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*c*d^3 - B^2*a^3*b*d^4)*i*x + (3*B^2*b^4*c^4
 - 8*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - B^2*a^4*d^4)*i)*log(e)^2 + 7
2*(B^2*b^4*d^4*i*n^2*x^4 + 4*B^2*a*b^3*d^4*i*n^2*x^3 + 6*B^2*a^2*b^2*d^4*i*
```

```
n^2*x^2 + 4*(B^2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*c*d^3)*i*n
^2*x + (3*B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2)*i*n^2)*l
og((b*x + a)/(d*x + c))^2 + 72*(3*A^2*b^4*c^4 - 8*A^2*a*b^3*c^3*d + 6*A^2*a
^2*b^2*c^2*d^2 - A^2*a^4*d^4)*i - 4*((5*B^2*b^4*c^3*d - 12*B^2*a*b^3*c^2*d^
2 - 108*B^2*a^2*b^2*c*d^3 + 115*B^2*a^3*b*d^4)*i*n^2 - 12*(A*B*b^4*c^3*d -
6*A*B*a*b^3*c^2*d^2 + 18*A*B*a^2*b^2*c*d^3 - 13*A*B*a^3*b*d^4)*i*n - 72*(A^
2*b^4*c^3*d - 3*A^2*a*b^3*c^2*d^2 + 3*A^2*a^2*b^2*c*d^3 - A^2*a^3*b*d^4)*i)
*x + 12*(12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*i*n*x^3 - 6*(B^2*b^4*c^2*d^2 -
8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d^4)*i*n*x^2 + (9*B^2*b^4*c^4 - 32*B^2*a*
b^3*c^3*d + 36*B^2*a^2*b^2*c^2*d^2 - 13*B^2*a^4*d^4)*i*n + 12*(3*A*B*b^4*c^
4 - 8*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^2*d^2 - A*B*a^4*d^4)*i + 4*((B^2*b^
4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 - 13*B^2*a^3*b*d^4)*i*
n + 12*(A*B*b^4*c^3*d - 3*A*B*a*b^3*c^2*d^2 + 3*A*B*a^2*b^2*c*d^3 - A*B*a^3
*b*d^4)*i)*x + 12*(B^2*b^4*d^4*i*n*x^4 + 4*B^2*a*b^3*d^4*i*n*x^3 + 6*B^2*a^
2*b^2*d^4*i*n*x^2 + 4*(B^2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*
c*d^3)*i*n*x + (3*B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2)*
i*n)*log((b*x + a)/(d*x + c)))*log(e) + 12*((13*B^2*b^4*d^4*i*n^2 + 12*A*B*
b^4*d^4*i*n)*x^4 + (9*B^2*b^4*c^4 - 32*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c^2
*d^2)*i*n^2 + 4*(12*A*B*a*b^3*d^4*i*n + (3*B^2*b^4*c*d^3 + 10*B^2*a*b^3*d^4
)*i*n^2)*x^3 + 12*(3*A*B*b^4*c^4 - 8*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^2*d^
2)*i*n + 6*(12*A*B*a^2*b^2*d^4*i*n - (B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 -
 6*B^2*a^2*b^2*d^4)*i*n^2)*x^2 + 4*((B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 +
18*B^2*a^2*b^2*c*d^3)*i*n^2 + 12*(A*B*b^4*c^3*d - 3*A*B*a*b^3*c^2*d^2 + 3*A
*B*a^2*b^2*c*d^3)*i*n)*x)*log((b*x + a)/(d*x + c)))/((b^9*c^3 - 3*a*b^8*c^2
*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*
d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2
*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^
2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d
 + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a
*g)^5, x)
```

3.168 $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=766

$$-\frac{B^2g^3i^2n^2(bc-ad)^6\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{30b^3d^4}-\frac{Bg^3i^2n(bc-ad)^6\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+11Bn\right)}{180b^3d^4}-\frac{Bg^3i^2n(a}{}$$

[Out] (3*B^2*(b*c - a*d)^5*g^3*i^2*n^2*x)/(20*b^2*d^3) + (B^2*(b*c - a*d)^2*g^3*i^2*n^2*(a + b*x)^4)/(60*b^3) - (3*B^2*(b*c - a*d)^4*g^3*i^2*n^2*(c + d*x)^2)/(40*b*d^4) + (B^2*(b*c - a*d)^3*g^3*i^2*n^2*(c + d*x)^3)/(60*d^4) - (B*(b*c - a*d)^3*g^3*i^2*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(90*b^3*d) - (B*(b*c - a*d)^2*g^3*i^2*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^3) - (B*(b*c - a*d)*g^3*i^2*n*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*b^2) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(60*b^3) + ((b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(15*b^2) + (g^3*i^2*(a + b*x)^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*b) + (B*(b*c - a*d)^4*g^3*i^2*n*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(180*b^3*d^2) - (B*(b*c - a*d)^5*g^3*i^2*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))/(180*b^3*d^3) - (B*(b*c - a*d)^6*g^3*i^2*n*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(180*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*Log[c + d*x])/(20*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(30*b^3*d^4)

Rubi [A] time = 3.34846, antiderivative size = 848, normalized size of antiderivative = 1.11, number of steps used = 83, number of rules used = 13, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.289, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^3i^2n^2\log^2(c+dx)(bc-ad)^6}{60b^3d^4}+\frac{B^2g^3i^2n^2\log(c+dx)(bc-ad)^6}{90b^3d^4}-\frac{B^2g^3i^2n^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)(bc-ad)^6}{30b^3d^4}+\frac{Bg^3}{}$$

Antiderivative was successfully verified.

[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]

[Out] -(A*B*(b*c - a*d)^5*g^3*i^2*n*x)/(30*b^2*d^3) + (B^2*(b*c - a*d)^5*g^3*i^2*n^2*x)/(45*b^2*d^3) - (7*B^2*(b*c - a*d)^4*g^3*i^2*n^2*(a + b*x)^2)/(360*b^3*d^2) + (B^2*(b*c - a*d)^3*g^3*i^2*n^2*(a + b*x)^3)/(60*b^3*d) + (B^2*(b*c - a*d)^2*g^3*i^2*n^2*(a + b*x)^4)/(60*b^3) - (B^2*(b*c - a*d)^5*g^3*i^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(30*b^3*d^3) + (B*(b*c - a*d)^4*g^3*i^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^3*d^2) - (B*(b*c - a*d)^3*g^3*i^2*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(90*b^3*d) - (7*B*(b*c - a*d)^2*g^3*i^2*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^3) - (B*d*(b*c - a*d)*g^3*i^2*n*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*b^3) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b^3) + (2*d*(b*c - a*d)*g^3*i^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b^3) + (d^2*g^3*i^2*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*b^3) + (B^2*(b*c - a*d)^6*g^3*i^2*n^2*Log[c + d*x])/(90*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(30*b^3*

```
d^4) + (B*(b*c - a*d)^6*g^3*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Lo
g[c + d*x])/(30*b^3*d^4) + (B^2*(b*c - a*d)^6*g^3*i^2*n^2*Log[c + d*x]^2)/(
60*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])/(30*b^3*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (168c+168dx)^2(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int\left(\frac{28224(bc-ad)^2(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2}\right.$$

$$= \frac{\left(28224(bc-ad)^2\right)\int (ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2}$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3} +$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3} +$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3} +$$

$$= \frac{7056(bc-ad)^2g^3(a+bx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3} +$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3} + \frac{2352B(bc-ad)^4g^3n(a+}{5}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3} - \frac{4704B^2(bc-ad)^5g^3n(a+}{5b^3d^3}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3} - \frac{4704B^2(bc-ad)^5g^3n(a+}{5b^3d^3}$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3} + \frac{3136B^2(bc-ad)^5g^3n^2x}{5b^2d^3} -$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3} + \frac{3136B^2(bc-ad)^5g^3n^2x}{5b^2d^3} -$$

$$= -\frac{4704AB(bc-ad)^5g^3nx}{5b^2d^3} + \frac{3136B^2(bc-ad)^5g^3n^2x}{5b^2d^3} -$$

Mathematica [B] time = 1.44315, size = 1634, normalized size = 2.13

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]
```

```
[Out] (g^3*i^2*(15*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2 + 24*d*(b*c - a*d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2 + 10*d^2*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (5*B*(b*c
```

```
 - a*d)^3*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*
((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n*(
b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)]))))/d^4 + (2*B*(b*c - a*d)^2*n*(24*A*b*d*(b*c - a*d)^3*x +
 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d^2*(b*
c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3*(b*c
- a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a + b*x)
^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*
x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] +
 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)
^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) +
 a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*
B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d)^
4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 - (B*(b*c - a*d)*n*(120*A*b*d*
(b*c - a*d)^4*x + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x)/(c + d*x
))^n] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) + 24*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*B*
(b*c - a*d)^5*n*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])*Log[c + d*x] + 20*B*(b*c - a*d)^3*n*(2*b*d*(b*c - a*d)*x - d^2
*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 5*B*(b*c - a*d)^2*n*(6*b*d*(
b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(
b*c - a*d)^3*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(12*b*d*(b*c - a*d)^3*x - 6*
d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3 - 3*d^4*(a +
b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) + 60*B*(b*c - a*d)^4*n*(b*d*x + (-(
b*c) + a*d)*Log[c + d*x]) + 60*B*(b*c - a*d)^5*n*((2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])))/(6*d^4)))/(60*b^3)
```

Maple [F] time = 0.734, size = 0, normalized size = 0.

$$\int (bgx+ag)^3 (dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 4.16418, size = 8035, normalized size = 10.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
```

```
[Out] 1/3*A*B*b^3*d^2*g^3*i^2*x^6*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/6*A^
2*b^3*d^2*g^3*i^2*x^6 + 4/5*A*B*b^3*c*d*g^3*i^2*x^5*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n) + 6/5*A*B*a*b^2*d^2*g^3*i^2*x^5*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n) + 2/5*A^2*b^3*c*d*g^3*i^2*x^5 + 3/5*A^2*a*b^2*d^2*g^3*i^2*x^5 +
 1/2*A*B*b^3*c^2*g^3*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*A*B
*a*b^2*c*d*g^3*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*B*a^2
*b*d^2*g^3*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*b^3*c^2
*g^3*i^2*x^4 + 3/2*A^2*a*b^2*c*d*g^3*i^2*x^4 + 3/4*A^2*a^2*b*d^2*g^3*i^2*x^
4 + 2*A*B*a*b^2*c^2*g^3*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 4*
A*B*a^2*b*c*d*g^3*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*A*B*
a^3*d^2*g^3*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b^2*c^2*
g^3*i^2*x^3 + 2*A^2*a^2*b*c*d*g^3*i^2*x^3 + 1/3*A^2*a^3*d^2*g^3*i^2*x^3 + 3
*A*B*a^2*b*c^2*g^3*i^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a
^3*c*d*g^3*i^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A^2*a^2*b*c
^2*g^3*i^2*x^2 + A^2*a^3*c*d*g^3*i^2*x^2 - 1/180*A*B*b^3*d^2*g^3*i^2*n*(60*
a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5
)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)
*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)
) + 1/15*A*B*b^3*c*d*g^3*i^2*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x +
c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3
 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) + 1
/10*A*B*a*b^2*d^2*g^3*i^2*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/
d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 +
6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/12
*A*B*b^3*c^2*g^3*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (
2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3
- a^3*d^3)*x)/(b^3*d^3)) - 1/2*A*B*a*b^2*c*d*g^3*i^2*n*(6*a^4*log(b*x + a)/
b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*
d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/4*A*B*a^2*b*d^
2*g^3*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^
2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*
x)/(b^3*d^3)) + A*B*a*b^2*c^2*g^3*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log
(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^
2)) + 2*A*B*a^2*b*c*d*g^3*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/
3*A*B*a^3*d^2*g^3*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 -
((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*a^2*
b*c^2*g^3*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*
x/(b*d)) - 2*A*B*a^3*c*d*g^3*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)
/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^3*c^2*g^3*i^2*n*(a*log(b*x + a)/b - c
*log(d*x + c)/d) + 2*A*B*a^3*c^2*g^3*i^2*x*log(e*(b*x/(d*x + c) + a/(d*x +
c))^n) + A^2*a^3*c^2*g^3*i^2*x - 1/180*(33*a^4*b*c^2*d^4*g^3*i^2*n^2 - 6*a^
5*c*d^5*g^3*i^2*n^2 - 2*(g^3*i^2*n^2 + 3*g^3*i^2*n*log(e))*b^5*c^6 + 6*(g^3
*i^2*n^2 + 6*g^3*i^2*n*log(e))*a*b^4*c^5*d + 3*(g^3*i^2*n^2 - 30*g^3*i^2*n*
log(e))*a^2*b^3*c^4*d^2 - 2*(17*g^3*i^2*n^2 - 60*g^3*i^2*n*log(e))*a^3*b^2*
c^3*d^3)*B^2*log(d*x + c)/(b^2*d^4) + 1/30*(b^6*c^6*g^3*i^2*n^2 - 6*a*b^5*c
^5*d*g^3*i^2*n^2 + 15*a^2*b^4*c^4*d^2*g^3*i^2*n^2 - 20*a^3*b^3*c^3*d^3*g^3*
i^2*n^2 + 15*a^4*b^2*c^2*d^4*g^3*i^2*n^2 - 6*a^5*b*c*d^5*g^3*i^2*n^2 + a^6*
d^6*g^3*i^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-
(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^4) + 1/360*(60*B^2*b^6*d^6*g^3*i^2*x
^6*log(e)^2 - 24*((g^3*i^2*n*log(e) - 6*g^3*i^2*log(e)^2)*b^6*c*d^5 - (g^3*
i^2*n*log(e) + 9*g^3*i^2*log(e)^2)*a*b^5*d^6)*B^2*x^5 + 6*((g^3*i^2*n^2 - 7
*g^3*i^2*n*log(e) + 15*g^3*i^2*log(e)^2)*b^6*c^2*d^4 - 2*(g^3*i^2*n^2 + 3*g
^3*i^2*n*log(e) - 45*g^3*i^2*log(e)^2)*a*b^5*c*d^5 + (g^3*i^2*n^2 + 13*g^3*
i^2*n*log(e) + 45*g^3*i^2*log(e)^2)*a^2*b^4*d^6)*B^2*x^4 + 2*((3*g^3*i^2*n^
2 - 2*g^3*i^2*n*log(e))*b^6*c^3*d^3 + 3*(g^3*i^2*n^2 - 26*g^3*i^2*n*log(e)
+ 60*g^3*i^2*log(e)^2)*a*b^5*c^2*d^4 - 3*(5*g^3*i^2*n^2 - 14*g^3*i^2*n*log(
e) - 120*g^3*i^2*log(e)^2)*a^2*b^4*c*d^5 + (9*g^3*i^2*n^2 + 38*g^3*i^2*n*lo
g(e) + 60*g^3*i^2*log(e)^2)*a^3*b^3*d^6)*B^2*x^3 - ((7*g^3*i^2*n^2 - 6*g^3*
```

i^2*n*log(e))*b^6*c^4*d^2 - 2*(23*g^3*i^2*n^2 - 18*g^3*i^2*n*log(e))*a*b^5*
c^3*d^3 + 60*(g^3*i^2*n^2 + 3*g^3*i^2*n*log(e) - 9*g^3*i^2*log(e)^2)*a^2*b^
4*c^2*d^4 - 2*(5*g^3*i^2*n^2 + 102*g^3*i^2*n*log(e) + 180*g^3*i^2*log(e)^2)
*a^3*b^3*c*d^5 - (11*g^3*i^2*n^2 + 6*g^3*i^2*n*log(e))*a^4*b^2*d^6)*B^2*x^2
 - 6*(15*a^4*b^2*c^2*d^4*g^3*i^2*n^2 - 6*a^5*b*c*d^5*g^3*i^2*n^2 + a^6*d^6*
g^3*i^2*n^2)*B^2*log(b*x + a)^2 - 12*(b^6*c^6*g^3*i^2*n^2 - 6*a*b^5*c^5*d*g
^3*i^2*n^2 + 15*a^2*b^4*c^4*d^2*g^3*i^2*n^2 - 20*a^3*b^3*c^3*d^3*g^3*i^2*n^
2)*B^2*log(b*x + a)*log(d*x + c) + 6*(b^6*c^6*g^3*i^2*n^2 - 6*a*b^5*c^5*d*g
^3*i^2*n^2 + 15*a^2*b^4*c^4*d^2*g^3*i^2*n^2 - 20*a^3*b^3*c^3*d^3*g^3*i^2*n^
2)*B^2*log(d*x + c)^2 + 2*(2*(2*g^3*i^2*n^2 - 3*g^3*i^2*n*log(e))*b^6*c^5*d
 - 9*(3*g^3*i^2*n^2 - 4*g^3*i^2*n*log(e))*a*b^5*c^4*d^2 + (77*g^3*i^2*n^2 -
 90*g^3*i^2*n*log(e))*a^2*b^4*c^3*d^3 - (97*g^3*i^2*n^2 - 30*g^3*i^2*n*log(
e) - 180*g^3*i^2*log(e)^2)*a^3*b^3*c^2*d^4 + 3*(17*g^3*i^2*n^2 + 12*g^3*i^2
*n*log(e))*a^4*b^2*c*d^5 - 2*(4*g^3*i^2*n^2 + 3*g^3*i^2*n*log(e))*a^5*b*d^6
)*B^2*x - 2*(6*a*b^5*c^5*d*g^3*i^2*n^2 - 33*a^2*b^4*c^4*d^2*g^3*i^2*n^2 + 7
4*a^3*b^3*c^3*d^3*g^3*i^2*n^2 - 9*(7*g^3*i^2*n^2 + 10*g^3*i^2*n*log(e))*a^4
*b^2*c^2*d^4 + 18*(g^3*i^2*n^2 + 2*g^3*i^2*n*log(e))*a^5*b*c*d^5 - 2*(g^3*i
^2*n^2 + 3*g^3*i^2*n*log(e))*a^6*d^6)*B^2*log(b*x + a) + 6*(10*B^2*b^6*d^6*
g^3*i^2*x^6 + 60*B^2*a^3*b^3*c^2*d^4*g^3*i^2*x + 12*(2*b^6*c*d^5*g^3*i^2 +
3*a*b^5*d^6*g^3*i^2)*B^2*x^5 + 15*(b^6*c^2*d^4*g^3*i^2 + 6*a*b^5*c*d^5*g^3*
i^2 + 3*a^2*b^4*d^6*g^3*i^2)*B^2*x^4 + 20*(3*a*b^5*c^2*d^4*g^3*i^2 + 6*a^2*
b^4*c*d^5*g^3*i^2 + a^3*b^3*d^6*g^3*i^2)*B^2*x^3 + 30*(3*a^2*b^4*c^2*d^4*g^
3*i^2 + 2*a^3*b^3*c*d^5*g^3*i^2)*B^2*x^2)*log((b*x + a)^n)^2 + 6*(10*B^2*b^
6*d^6*g^3*i^2*x^6 + 60*B^2*a^3*b^3*c^2*d^4*g^3*i^2*x + 12*(2*b^6*c*d^5*g^3*
i^2 + 3*a*b^5*d^6*g^3*i^2)*B^2*x^5 + 15*(b^6*c^2*d^4*g^3*i^2 + 6*a*b^5*c*d^
5*g^3*i^2 + 3*a^2*b^4*d^6*g^3*i^2)*B^2*x^4 + 20*(3*a*b^5*c^2*d^4*g^3*i^2 +
6*a^2*b^4*c*d^5*g^3*i^2 + a^3*b^3*d^6*g^3*i^2)*B^2*x^3 + 30*(3*a^2*b^4*c^2*
d^4*g^3*i^2 + 2*a^3*b^3*c*d^5*g^3*i^2)*B^2*x^2)*log((d*x + c)^n)^2 + 2*(60*
B^2*b^6*d^6*g^3*i^2*x^6*log(e) - 12*((g^3*i^2*n - 12*g^3*i^2*log(e))*b^6*c*
d^5 - (g^3*i^2*n + 18*g^3*i^2*log(e))*a*b^5*d^6)*B^2*x^5 - 3*((7*g^3*i^2*n
 - 30*g^3*i^2*log(e))*b^6*c^2*d^4 + 6*(g^3*i^2*n - 30*g^3*i^2*log(e))*a*b^5*
c*d^5 - (13*g^3*i^2*n + 90*g^3*i^2*log(e))*a^2*b^4*d^6)*B^2*x^4 - 2*(b^6*c^
3*d^3*g^3*i^2*n + 3*(13*g^3*i^2*n - 60*g^3*i^2*log(e))*a*b^5*c^2*d^4 - 3*(7
*g^3*i^2*n + 120*g^3*i^2*log(e))*a^2*b^4*c*d^5 - (19*g^3*i^2*n + 60*g^3*i^2
*log(e))*a^3*b^3*d^6)*B^2*x^3 + 3*(b^6*c^4*d^2*g^3*i^2*n - 6*a*b^5*c^3*d^3*
g^3*i^2*n + a^4*b^2*d^6*g^3*i^2*n - 30*(g^3*i^2*n - 6*g^3*i^2*log(e))*a^2*b
^4*c^2*d^4 + 2*(17*g^3*i^2*n + 60*g^3*i^2*log(e))*a^3*b^3*c*d^5)*B^2*x^2 -
6*(b^6*c^5*d*g^3*i^2*n - 6*a*b^5*c^4*d^2*g^3*i^2*n + 15*a^2*b^4*c^3*d^3*g^3
*i^2*n - 6*a^4*b^2*c*d^5*g^3*i^2*n + a^5*b*d^6*g^3*i^2*n - 5*(g^3*i^2*n + 1
2*g^3*i^2*log(e))*a^3*b^3*c^2*d^4)*B^2*x + 6*(15*a^4*b^2*c^2*d^4*g^3*i^2*n
 - 6*a^5*b*c*d^5*g^3*i^2*n + a^6*d^6*g^3*i^2*n)*B^2*log(b*x + a) + 6*(b^6*c^
6*g^3*i^2*n - 6*a*b^5*c^5*d*g^3*i^2*n + 15*a^2*b^4*c^4*d^2*g^3*i^2*n - 20*a
^3*b^3*c^3*d^3*g^3*i^2*n)*B^2*log(d*x + c))*log((b*x + a)^n) - 2*(60*B^2*b^
6*d^6*g^3*i^2*x^6*log(e) - 12*((g^3*i^2*n - 12*g^3*i^2*log(e))*b^6*c*d^5 -
(g^3*i^2*n + 18*g^3*i^2*log(e))*a*b^5*d^6)*B^2*x^5 - 3*((7*g^3*i^2*n - 30*g
^3*i^2*log(e))*b^6*c^2*d^4 + 6*(g^3*i^2*n - 30*g^3*i^2*log(e))*a*b^5*c*d^5
 - (13*g^3*i^2*n + 90*g^3*i^2*log(e))*a^2*b^4*d^6)*B^2*x^4 - 2*(b^6*c^3*d^3*
g^3*i^2*n + 3*(13*g^3*i^2*n - 60*g^3*i^2*log(e))*a*b^5*c^2*d^4 - 3*(7*g^3*i
^2*n + 120*g^3*i^2*log(e))*a^2*b^4*c*d^5 - (19*g^3*i^2*n + 60*g^3*i^2*log(e
))*a^3*b^3*d^6)*B^2*x^3 + 3*(b^6*c^4*d^2*g^3*i^2*n - 6*a*b^5*c^3*d^3*g^3*i^
2*n + a^4*b^2*d^6*g^3*i^2*n - 30*(g^3*i^2*n - 6*g^3*i^2*log(e))*a^2*b^4*c^2
d^4 + 2(17*g^3*i^2*n + 60*g^3*i^2*log(e))*a^3*b^3*c*d^5)*B^2*x^2 - 6*(b^6
*c^5*d*g^3*i^2*n - 6*a*b^5*c^4*d^2*g^3*i^2*n + 15*a^2*b^4*c^3*d^3*g^3*i^2*n
 - 6*a^4*b^2*c*d^5*g^3*i^2*n + a^5*b*d^6*g^3*i^2*n - 5*(g^3*i^2*n + 12*g^3*
i^2*log(e))*a^3*b^3*c^2*d^4)*B^2*x + 6*(15*a^4*b^2*c^2*d^4*g^3*i^2*n - 6*a^
5*b*c*d^5*g^3*i^2*n + a^6*d^6*g^3*i^2*n)*B^2*log(b*x + a) + 6*(b^6*c^6*g^3*
i^2*n - 6*a*b^5*c^5*d*g^3*i^2*n + 15*a^2*b^4*c^4*d^2*g^3*i^2*n - 20*a^3*b^3
*c^3*d^3*g^3*i^2*n)*B^2*log(d*x + c) + 6*(10*B^2*b^6*d^6*g^3*i^2*x^6 + 60*B
^2*a^3*b^3*c^2*d^4*g^3*i^2*x + 12*(2*b^6*c*d^5*g^3*i^2 + 3*a*b^5*d^6*g^3*i^

```
2)*B^2*x^5 + 15*(b^6*c^2*d^4*g^3*i^2 + 6*a*b^5*c*d^5*g^3*i^2 + 3*a^2*b^4*d^
6*g^3*i^2)*B^2*x^4 + 20*(3*a*b^5*c^2*d^4*g^3*i^2 + 6*a^2*b^4*c*d^5*g^3*i^2
+ a^3*b^3*d^6*g^3*i^2)*B^2*x^3 + 30*(3*a^2*b^4*c^2*d^4*g^3*i^2 + 2*a^3*b^3*
c*d^5*g^3*i^2)*B^2*x^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3d^2g^3i^2x^5 + A^2a^3c^2g^3i^2 + \left(2\,A^2b^3cd + 3\,A^2ab^2d^2\right)g^3i^2x^4 + \left(A^2b^3c^2 + 6\,A^2ab^2cd + 3\,A^2a^2bd^2\right)g^3i^2x^3 + \left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] integral(A^2*b^3*d^2*g^3*i^2*x^5 + A^2*a^3*c^2*g^3*i^2 + (2*A^2*b^3*c*d + 3
*A^2*a*b^2*d^2)*g^3*i^2*x^4 + (A^2*b^3*c^2 + 6*A^2*a*b^2*c*d + 3*A^2*a^2*b*
d^2)*g^3*i^2*x^3 + (3*A^2*a*b^2*c^2 + 6*A^2*a^2*b*c*d + A^2*a^3*d^2)*g^3*i^
2*x^2 + (3*A^2*a^2*b*c^2 + 2*A^2*a^3*c*d)*g^3*i^2*x + (B^2*b^3*d^2*g^3*i^2*
x^5 + B^2*a^3*c^2*g^3*i^2 + (2*B^2*b^3*c*d + 3*B^2*a*b^2*d^2)*g^3*i^2*x^4 +
 (B^2*b^3*c^2 + 6*B^2*a*b^2*c*d + 3*B^2*a^2*b*d^2)*g^3*i^2*x^3 + (3*B^2*a*b
^2*c^2 + 6*B^2*a^2*b*c*d + B^2*a^3*d^2)*g^3*i^2*x^2 + (3*B^2*a^2*b*c^2 + 2*
B^2*a^3*c*d)*g^3*i^2*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*d^2*g
^3*i^2*x^5 + A*B*a^3*c^2*g^3*i^2 + (2*A*B*b^3*c*d + 3*A*B*a*b^2*d^2)*g^3*i^
2*x^4 + (A*B*b^3*c^2 + 6*A*B*a*b^2*c*d + 3*A*B*a^2*b*d^2)*g^3*i^2*x^3 + (3*
A*B*a*b^2*c^2 + 6*A*B*a^2*b*c*d + A*B*a^3*d^2)*g^3*i^2*x^2 + (3*A*B*a^2*b*c
^2 + 2*A*B*a^3*c*d)*g^3*i^2*x)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 (dix + ci)^2 \left(B\log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n)
 + A)^2, x)
```

3.169 $\int (ag+bgx)^2(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=819

$$\frac{Bg^2i^2n\left(2A+3Bn+2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)(bc-ad)^5}{30b^3d^3}+\frac{B^2g^2i^2n^2\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^5}{30b^3d^3}+\frac{B^2g^2i^2n^2\log(c+dx)}{10b^3d^3}$$

```
[Out] -(B^2*(b*c - a*d)^4*g^2*i^2*n^2*x)/(10*b^2*d^2) - (B^2*(b*c - a*d)^3*g^2*i^
2*n^2*(c + d*x)^2)/(20*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^2*n^2*(c + d*x)^3)
/(30*d^3) - (B*(b*c - a*d)^3*g^2*i^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(30*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*n*(a + b*x)^3*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(15*b^3) - (B*(b*c - a*d)^3*g^2*i^2*n*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b*d^3) + (4*B*(b*c - a*d
)^2*g^2*i^2*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*d^3)
- (b*B*(b*c - a*d)*g^2*i^2*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(10*d^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2)/(30*b^3) + ((b*c - a*d)*g^2*i^2*(a + b*x)^3*(c + d*x)*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(10*b^2) + (g^2*i^2*(a + b*x)^3*(c
+ d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) + (B*(b*c - a*d)^4
*g^2*i^2*n*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*
b^3*d^2) + (B*(b*c - a*d)^5*g^2*i^2*n*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)/(
c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(30*b^3*d^3) + (B^2*(b*c - a*
d)^5*g^2*i^2*n^2*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) + (B^2*(b*c - a*d)^
5*g^2*i^2*n^2*Log[c + d*x])/(10*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*n^2*P
olyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(15*b^3*d^3)
```

Rubi [A] time = 2.60906, antiderivative size = 714, normalized size of antiderivative = 0.87, number of steps used = 71, number of rules used = 13, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.289, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^2i^2n^2(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{15b^3d^3}-\frac{Bg^2i^2n(bc-ad)^5\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{15b^3d^3}+\frac{d^2g^2i^2(a+bx)^5\left(B\log\right.}{5b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2,x]
```

```
[Out] (A*B*(b*c - a*d)^4*g^2*i^2*n*x)/(15*b^2*d^2) - (B^2*(b*c - a*d)^4*g^2*i^2*n
^2*x)/(15*b^2*d^2) + (B^2*(b*c - a*d)^3*g^2*i^2*n^2*(a + b*x)^2)/(20*b^3*d)
 + (B^2*(b*c - a*d)^2*g^2*i^2*n^2*(a + b*x)^3)/(30*b^3) + (B^2*(b*c - a*d)^
4*g^2*i^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(15*b^3*d^2) - (B*(b*
c - a*d)^3*g^2*i^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3
0*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(5*b^3) - (B*d*(b*c - a*d)*g^2*i^2*n*(a + b*x)^4*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(10*b^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b^3) + (d*(b*c - a*d)*g^2*i^2*
(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^3) + (d^2*g^2*i^
2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b^3) + (B^2*(b*c
 - a*d)^5*g^2*i^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(15*b
^3*d^3) - (B*(b*c - a*d)^5*g^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[c + d*x])/(15*b^3*d^3) - (B^2*(b*c - a*d)^5*g^2*i^2*n^2*Log[c + d*x]^2
```

```
)/(30*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*n^2*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(15*b^3*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (169c+169dx)^2(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx=\int\left(\frac{(-bc+ad)^2g^2(169c+169dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{d^2}\right.$$

$$=\frac{(b^2g^2)\int(169c+169dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx}{28561d^2}$$

$$=\frac{28561(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^3}$$

$$=\frac{28561(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^3}$$

$$=\frac{28561(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^3}$$

$$=\frac{28561(bc-ad)^2g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^3}$$

$$=-\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2}-\frac{28561B(bc-ad)^3g^2n(c}{}$$

$$=-\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2}-\frac{28561B^2(bc-ad)^4g^2n(a}{15b^3}$$

$$=-\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2}-\frac{28561B^2(bc-ad)^4g^2n(a}{15b^3}$$

$$=-\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2}-\frac{28561B^2(bc-ad)^4g^2n^2x}{15b^2d^2}$$

$$=-\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2}-\frac{28561B^2(bc-ad)^4g^2n^2x}{15b^2d^2}$$

$$=-\frac{28561AB(bc-ad)^4g^2nx}{15b^2d^2}-\frac{28561B^2(bc-ad)^4g^2n^2x}{15b^2d^2}$$

Mathematica [A] time = 1.02239, size = 1254, normalized size = 1.53

$$\frac{g^2i^2\left(12d^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(a+bx)^5+30d^4(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(a+bx)^4+20d^3(bc-ad)^2\left(A\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]
```

```
[Out] (g^2*i^2*(20*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2 + 30*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x)
```

```
)^n])^2 + 12*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 20*
B*(b*c - a*d)^3*n*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] - d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(b*d*x + (-(b*c) +
 a*d)*Log[c + d*x]) + B*(b*c - a*d)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
 - 10*B*(b*c - a*d)^2*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a +
 b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*
(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c
- a*d)^2*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*
Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])) + B*(b*c - a*d)*n*(24*A*b*d*(b*c - a*d)^3*x
 + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d^2*(
b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3*(b*
c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a + b*
x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c +
d*x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x]
 + 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*
d)^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c)
 + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 1
2*B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d
)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(60*b^3*d^3)
```

Maple [F] time = 0.691, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{2} (dix + ci)^{2} \left(A + B \ln \left(e \left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.92027, size = 5733, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
```

```
[Out] 2/5*A*B*b^2*d^2*g^2*i^2*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^
2*b^2*d^2*g^2*i^2*x^5 + A*B*b^2*c*d*g^2*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n) + A*B*a*b*d^2*g^2*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
) + 1/2*A^2*b^2*c*d*g^2*i^2*x^4 + 1/2*A^2*a*b*d^2*g^2*i^2*x^4 + 2/3*A*B*b^2
*c^2*g^2*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 8/3*A*B*a*b*c*d*g
^2*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*A*B*a^2*d^2*g^2*i^2
```

```
*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*b^2*c^2*g^2*i^2*x^3 +
 4/3*A^2*a*b*c*d*g^2*i^2*x^3 + 1/3*A^2*a^2*d^2*g^2*i^2*x^3 + 2*A*B*a*b*c^2*
g^2*i^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a^2*c*d*g^2*i^2*
x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b*c^2*g^2*i^2*x^2 + A^2*
a^2*c*d*g^2*i^2*x^2 + 1/30*A*B*b^2*d^2*g^2*i^2*n*(12*a^5*log(b*x + a)/b^5 -
 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2
- a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)
*x)/(b^4*d^4)) - 1/6*A*B*b^2*c*d*g^2*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*
log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^
3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/6*A*B*a*b*d^2*g^2*i^2*n*(6
*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
+ 1/3*A*B*b^2*c^2*g^2*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 4/3*A*
B*a*b*c*d*g^2*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^
2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/3*A*B*a^2*d^
2*g^2*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*a*b*c^2*g^2*i^2*
n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*A
*B*a^2*c*d*g^2*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c -
a*d)*x/(b*d)) + 2*A*B*a^2*c^2*g^2*i^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/
d) + 2*A*B*a^2*c^2*g^2*i^2*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a
^2*c^2*g^2*i^2*x - 1/30*(9*a^3*b*c^2*d^3*g^2*i^2*n^2 - 2*a^4*c*d^4*g^2*i^2*
n^2 + 2*b^4*c^5*g^2*i^2*n*log(e) + 2*(g^2*i^2*n^2 - 5*g^2*i^2*n*log(e))*a*b
^3*c^4*d - (9*g^2*i^2*n^2 - 20*g^2*i^2*n*log(e))*a^2*b^2*c^3*d^2)*B^2*log(d
*x + c)/(b^2*d^3) - 1/15*(b^5*c^5*g^2*i^2*n^2 - 5*a*b^4*c^4*d*g^2*i^2*n^2 +
 10*a^2*b^3*c^3*d^2*g^2*i^2*n^2 - 10*a^3*b^2*c^2*d^3*g^2*i^2*n^2 + 5*a^4*b*
c*d^4*g^2*i^2*n^2 - a^5*d^5*g^2*i^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b
*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/60*(1
2*B^2*b^5*d^5*g^2*i^2*x^5*log(e)^2 - 6*((g^2*i^2*n*log(e) - 5*g^2*i^2*log(e
)^2)*b^5*c*d^4 - (g^2*i^2*n*log(e) + 5*g^2*i^2*log(e)^2)*a*b^4*d^5)*B^2*x^4
 + 2*((g^2*i^2*n^2 - 6*g^2*i^2*n*log(e) + 10*g^2*i^2*log(e)^2)*b^5*c^2*d^3
- 2*(g^2*i^2*n^2 - 20*g^2*i^2*log(e)^2)*a*b^4*c*d^4 + (g^2*i^2*n^2 + 6*g^2*
i^2*n*log(e) + 10*g^2*i^2*log(e)^2)*a^2*b^3*d^5)*B^2*x^3 + ((3*g^2*i^2*n^2
- 2*g^2*i^2*n*log(e))*b^5*c^3*d^2 - 3*(g^2*i^2*n^2 + 10*g^2*i^2*n*log(e) -
20*g^2*i^2*log(e)^2)*a*b^4*c^2*d^3 - 3*(g^2*i^2*n^2 - 10*g^2*i^2*n*log(e) -
 20*g^2*i^2*log(e)^2)*a^2*b^3*c*d^4 + (3*g^2*i^2*n^2 + 2*g^2*i^2*n*log(e))*
a^3*b^2*d^5)*B^2*x^2 - 2*(10*a^3*b^2*c^2*d^3*g^2*i^2*n^2 - 5*a^4*b*c*d^4*g^
2*i^2*n^2 + a^5*d^5*g^2*i^2*n^2)*B^2*log(b*x + a)^2 + 4*(b^5*c^5*g^2*i^2*n^
2 - 5*a*b^4*c^4*d*g^2*i^2*n^2 + 10*a^2*b^3*c^3*d^2*g^2*i^2*n^2)*B^2*log(b*x
 + a)*log(d*x + c) - 2*(b^5*c^5*g^2*i^2*n^2 - 5*a*b^4*c^4*d*g^2*i^2*n^2 + 1
0*a^2*b^3*c^3*d^2*g^2*i^2*n^2)*B^2*log(d*x + c)^2 - 2*(2*(g^2*i^2*n^2 - g^2
*i^2*n*log(e))*b^5*c^4*d - (11*g^2*i^2*n^2 - 10*g^2*i^2*n*log(e))*a*b^4*c^3
*d^2 + 6*(3*g^2*i^2*n^2 - 5*g^2*i^2*log(e)^2)*a^2*b^3*c^2*d^3 - (11*g^2*i^2
*n^2 + 10*g^2*i^2*n*log(e))*a^3*b^2*c*d^4 + 2*(g^2*i^2*n^2 + g^2*i^2*n*log(
e))*a^4*b*d^5)*B^2*x + 2*(2*a*b^4*c^4*d*g^2*i^2*n^2 - 9*a^2*b^3*c^3*d^2*g^2
*i^2*n^2 + 2*a^5*d^5*g^2*i^2*n*log(e) + (9*g^2*i^2*n^2 + 20*g^2*i^2*n*log(e
))*a^3*b^2*c^2*d^3 - 2*(g^2*i^2*n^2 + 5*g^2*i^2*n*log(e))*a^4*b*c*d^4)*B^2*
log(b*x + a) + 2*(6*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^
2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*
g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*
c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i^2)*B^2*x^2)*log((b*x + a)^n)^2 + 2*(6
*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(b^5*c*d^4
*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2*i^2 + 4*a*b^4*c
*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^2*i^2 + a
^2*b^3*c*d^4*g^2*i^2)*B^2*x^2)*log((d*x + c)^n)^2 + 2*(12*B^2*b^5*d^5*g^2*i
^2*x^5*log(e) - 3*((g^2*i^2*n - 10*g^2*i^2*log(e))*b^5*c*d^4 - (g^2*i^2*n +
 10*g^2*i^2*log(e))*a*b^4*d^5)*B^2*x^4 + 2*(40*a*b^4*c*d^4*g^2*i^2*log(e) -
 (3*g^2*i^2*n - 10*g^2*i^2*log(e))*b^5*c^2*d^3 + (3*g^2*i^2*n + 10*g^2*i^2*
```

```
log(e))*a^2*b^3*d^5)*B^2*x^3 - (b^5*c^3*d^2*g^2*i^2*n - a^3*b^2*d^5*g^2*i^2
*n + 15*(g^2*i^2*n - 4*g^2*i^2*log(e))*a*b^4*c^2*d^3 - 15*(g^2*i^2*n + 4*g^
2*i^2*log(e))*a^2*b^3*c*d^4)*B^2*x^2 + 2*(b^5*c^4*d*g^2*i^2*n - 5*a*b^4*c^3
*d^2*g^2*i^2*n + 5*a^3*b^2*c*d^4*g^2*i^2*n - a^4*b*d^5*g^2*i^2*n + 30*a^2*b
^3*c^2*d^3*g^2*i^2*log(e))*B^2*x + 2*(10*a^3*b^2*c^2*d^3*g^2*i^2*n - 5*a^4*
b*c*d^4*g^2*i^2*n + a^5*d^5*g^2*i^2*n)*B^2*log(b*x + a) - 2*(b^5*c^5*g^2*i^
2*n - 5*a*b^4*c^4*d*g^2*i^2*n + 10*a^2*b^3*c^3*d^2*g^2*i^2*n)*B^2*log(d*x +
 c))*log((b*x + a)^n) - 2*(12*B^2*b^5*d^5*g^2*i^2*x^5*log(e) - 3*((g^2*i^2*
n - 10*g^2*i^2*log(e))*b^5*c*d^4 - (g^2*i^2*n + 10*g^2*i^2*log(e))*a*b^4*d^
5)*B^2*x^4 + 2*(40*a*b^4*c*d^4*g^2*i^2*log(e) - (3*g^2*i^2*n - 10*g^2*i^2*l
og(e))*b^5*c^2*d^3 + (3*g^2*i^2*n + 10*g^2*i^2*log(e))*a^2*b^3*d^5)*B^2*x^3
 - (b^5*c^3*d^2*g^2*i^2*n - a^3*b^2*d^5*g^2*i^2*n + 15*(g^2*i^2*n - 4*g^2*i
^2*log(e))*a*b^4*c^2*d^3 - 15*(g^2*i^2*n + 4*g^2*i^2*log(e))*a^2*b^3*c*d^4)
*B^2*x^2 + 2*(b^5*c^4*d*g^2*i^2*n - 5*a*b^4*c^3*d^2*g^2*i^2*n + 5*a^3*b^2*c
*d^4*g^2*i^2*n - a^4*b*d^5*g^2*i^2*n + 30*a^2*b^3*c^2*d^3*g^2*i^2*log(e))*B
^2*x + 2*(10*a^3*b^2*c^2*d^3*g^2*i^2*n - 5*a^4*b*c*d^4*g^2*i^2*n + a^5*d^5*
g^2*i^2*n)*B^2*log(b*x + a) - 2*(b^5*c^5*g^2*i^2*n - 5*a*b^4*c^4*d*g^2*i^2*
n + 10*a^2*b^3*c^3*d^2*g^2*i^2*n)*B^2*log(d*x + c) + 2*(6*B^2*b^5*d^5*g^2*i
^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d
^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2
*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i
^2)*B^2*x^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2d^2g^2i^2x^4 + A^2a^2c^2g^2i^2 + 2\left(A^2b^2cd + A^2abd^2\right)g^2i^2x^3 + \left(A^2b^2c^2 + 4\,A^2abcd + A^2a^2d^2\right)g^2i^2x^2 + 2\left(A^2abc^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] integral(A^2*b^2*d^2*g^2*i^2*x^4 + A^2*a^2*c^2*g^2*i^2 + 2*(A^2*b^2*c*d + A
^2*a*b*d^2)*g^2*i^2*x^3 + (A^2*b^2*c^2 + 4*A^2*a*b*c*d + A^2*a^2*d^2)*g^2*i
^2*x^2 + 2*(A^2*a*b*c^2 + A^2*a^2*c*d)*g^2*i^2*x + (B^2*b^2*d^2*g^2*i^2*x^4
 + B^2*a^2*c^2*g^2*i^2 + 2*(B^2*b^2*c*d + B^2*a*b*d^2)*g^2*i^2*x^3 + (B^2*b
^2*c^2 + 4*B^2*a*b*c*d + B^2*a^2*d^2)*g^2*i^2*x^2 + 2*(B^2*a*b*c^2 + B^2*a^
2*c*d)*g^2*i^2*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^2*d^2*g^2*i^2
*x^4 + A*B*a^2*c^2*g^2*i^2 + 2*(A*B*b^2*c*d + A*B*a*b*d^2)*g^2*i^2*x^3 + (A
*B*b^2*c^2 + 4*A*B*a*b*c*d + A*B*a^2*d^2)*g^2*i^2*x^2 + 2*(A*B*a*b*c^2 + A*
B*a^2*c*d)*g^2*i^2*x)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^2 (dix + ci)^2 \left(B\log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n)
 + A)^2, x)
```

3.170 $\int (ag+bgx)(ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=635

$$-\frac{B^2gi^2n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{6b^3d^2}-\frac{Bgi^2n(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{6b^3d^2}-\frac{Bgi^2n(a+bx)(b\cdots}{\cdots}$$

```
[Out] (B^2*(b*c - a*d)^3*g*i^2*n^2*x)/(12*b^2*d) + (B^2*(b*c - a*d)^2*g*i^2*n^2*(
c + d*x)^2)/(12*b*d^2) - (B*(b*c - a*d)^3*g*i^2*n*(a + b*x)*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/(6*b^3*d) - (B*(b*c - a*d)^2*g*i^2*n*(a + b*x)^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^3) + (B*(b*c - a*d)^2*g*i^2*n*(
c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b*d^2) - (B*(b*c - a*
d)*g*i^2*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^2) + ((
b*c - a*d)^2*g*i^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(1
2*b^3) + ((b*c - a*d)*g*i^2*(a + b*x)^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^2)/(6*b^2) + (g*i^2*(a + b*x)^2*(c + d*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])^2)/(4*b) - (B*(b*c - a*d)^4*g*i^2*n*(A + B*n + B*Log[
e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(6*b^3*d^2) - (
B^2*(b*c - a*d)^4*g*i^2*n^2*Log[(a + b*x)/(c + d*x)])/(12*b^3*d^2) - (B^2*(
b*c - a*d)^4*g*i^2*n^2*Log[c + d*x])/(4*b^3*d^2) - (B^2*(b*c - a*d)^4*g*i^2
*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(6*b^3*d^2)
```

Rubi [A] time = 1.65681, antiderivative size = 614, normalized size of antiderivative = 0.97, number of steps used = 44, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2gi^2n^2(bc-ad)^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{6b^3d^2}+\frac{Bgi^2n(bc-ad)^4\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{6b^3d^2}+\frac{ABgi^2nx(bc-ad)^3}{6b^2d}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] (A*B*(b*c - a*d)^3*g*i^2*n*x)/(6*b^2*d) + (B^2*(b*c - a*d)^3*g*i^2*n^2*x)/(
12*b^2*d) + (B^2*(b*c - a*d)^2*g*i^2*n^2*(c + d*x)^2)/(12*b*d^2) + (B^2*(b*
c - a*d)^4*g*i^2*n^2*Log[a + b*x])/(12*b^3*d^2) - (B^2*(b*c - a*d)^4*g*i^2*
n^2*Log[a + b*x]^2)/(12*b^3*d^2) + (B^2*(b*c - a*d)^3*g*i^2*n*(a + b*x)*Log
[e*((a + b*x)/(c + d*x))^n])/(6*b^3*d) + (B*(b*c - a*d)^2*g*i^2*n*(c + d*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(12*b*d^2) - (B*(b*c - a*d)*g*i^
2*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^2) + (B*(b*c -
 a*d)^4*g*i^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^3
*d^2) - ((b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2)/(3*d^2) + (b*g*i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/(4*d^2) - (B^2*(b*c - a*d)^4*g*i^2*n^2*Log[c + d*x])/(6*b^3*d^2) + (B^2
*(b*c - a*d)^4*g*i^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(6*b^
3*d^2) + (B^2*(b*c - a*d)^4*g*i^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/(6*b^3*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
```

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (170c+170dx)^2(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(\frac{(-bc+ad)g(170c+170dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{d}\right.$$

$$= \frac{(bg)\int(170c+170dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{170d} +$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^2} +$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^2} +$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^2} +$$

$$= -\frac{28900(bc-ad)g(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d^2} +$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B(bc-ad)^2gn(c+dx)^2}{3bd}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{14450B^2(bc-ad)^3gn(a+bx}{3b^3d}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{14450B^2(bc-ad)^3gn(a+bx}{3b^3d}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B^2(bc-ad)^3gn^2x}{3b^2d} + \frac{72}{}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B^2(bc-ad)^3gn^2x}{3b^2d} + \frac{72}{}$$

$$= \frac{14450AB(bc-ad)^3gnx}{3b^2d} + \frac{7225B^2(bc-ad)^3gn^2x}{3b^2d} + \frac{72}{}$$

Mathematica [A] time = 0.629466, size = 713, normalized size = 1.12

$$gi^2\left(\frac{4Bn(bc-ad)^2\left(-Bn(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+b^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2(bc-ad)^2\log(a+bx)\left(B\log\right.\right.}{b^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g*i^2*(-4*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
 + 3*b*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (4*B*(b*c - a
```

```
*d)^2*n*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a
 + b*x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2
*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c
+ d*x] - B*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x)
)/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3 - (B*(b
*c - a*d)*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c -
a*d)*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2
 + 2*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a
+ b*x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 + 6*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*
B*(b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a +
 b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)])))/b^3))/(12*d^2)
```

Maple [F] time = 0.48, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right) (dix + ci)^2 \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.88865, size = 3594, normalized size = 5.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 1/2*A*B*b*d^2*g*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*b*
d^2*g*i^2*x^4 + 4/3*A*B*b*c*d*g*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 2/3*A*B*a*d^2*g*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*
A^2*b*c*d*g*i^2*x^3 + 1/3*A^2*a*d^2*g*i^2*x^3 + A*B*b*c^2*g*i^2*x^2*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a*c*d*g*i^2*x^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n) + 1/2*A^2*b*c^2*g*i^2*x^2 + A^2*a*c*d*g*i^2*x^2 - 1/12*
A*B*b*d^2*g*i^2*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^
3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3
*d^3)*x)/(b^3*d^3)) + 2/3*A*B*b*c*d*g*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3
*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^
2*d^2)) + 1/3*A*B*a*d^2*g*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - A*
B*b*c^2*g*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*
x/(b*d)) - 2*A*B*a*c*d*g*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
 + (b*c - a*d)*x/(b*d)) + 2*A*B*a*c^2*g*i^2*n*(a*log(b*x + a)/b - c*log(d*x
 + c)/d) + 2*A*B*a*c^2*g*i^2*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2
*a*c^2*g*i^2*x - 1/12*(7*a^2*b*c^2*d^2*g*i^2*n^2 - 2*a^3*c*d^3*g*i^2*n^2 +
(g*i^2*n^2 - 2*g*i^2*n*log(e))*b^3*c^4 - 2*(3*g*i^2*n^2 - 4*g*i^2*n*log(e))
```

```
*a*b^2*c^3*d)*B^2*log(d*x + c)/(b^2*d^2) + 1/6*(b^4*c^4*g*i^2*n^2 - 4*a*b^3
*c^3*d*g*i^2*n^2 + 6*a^2*b^2*c^2*d^2*g*i^2*n^2 - 4*a^3*b*c*d^3*g*i^2*n^2 +
a^4*d^4*g*i^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog
(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^2) + 1/12*(3*B^2*b^4*d^4*g*i^2*x^4
*log(e)^2 - 2*((g*i^2*n*log(e) - 4*g*i^2*log(e)^2)*b^4*c*d^3 - (g*i^2*n*log
(e) + 2*g*i^2*log(e)^2)*a*b^3*d^4)*B^2*x^3 + ((g*i^2*n^2 - 5*g*i^2*n*log(e)
 + 6*g*i^2*log(e)^2)*b^4*c^2*d^2 - 2*(g*i^2*n^2 - 2*g*i^2*n*log(e) - 6*g*i^
2*log(e)^2)*a*b^3*c*d^3 + (g*i^2*n^2 + g*i^2*n*log(e))*a^2*b^2*d^4)*B^2*x^2
 - (6*a^2*b^2*c^2*d^2*g*i^2*n^2 - 4*a^3*b*c*d^3*g*i^2*n^2 + a^4*d^4*g*i^2*n
^2)*B^2*log(b*x + a)^2 - 2*(b^4*c^4*g*i^2*n^2 - 4*a*b^3*c^3*d*g*i^2*n^2)*B^
2*log(b*x + a)*log(d*x + c) + (b^4*c^4*g*i^2*n^2 - 4*a*b^3*c^3*d*g*i^2*n^2)
*B^2*log(d*x + c)^2 + ((3*g*i^2*n^2 - 2*g*i^2*n*log(e))*b^4*c^3*d - (7*g*i^
2*n^2 + 4*g*i^2*n*log(e) - 12*g*i^2*log(e)^2)*a*b^3*c^2*d^2 + (5*g*i^2*n^2
+ 8*g*i^2*n*log(e))*a^2*b^2*c*d^3 - (g*i^2*n^2 + 2*g*i^2*n*log(e))*a^3*b*d^
4)*B^2*x - (2*a*b^3*c^3*d*g*i^2*n^2 - (g*i^2*n^2 + 12*g*i^2*n*log(e))*a^2*b
^2*c^2*d^2 - 2*(g*i^2*n^2 - 4*g*i^2*n*log(e))*a^3*b*c*d^3 + (g*i^2*n^2 - 2*
g*i^2*n*log(e))*a^4*d^4)*B^2*log(b*x + a) + (3*B^2*b^4*d^4*g*i^2*x^4 + 12*B
^2*a*b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g*i^2 + a*b^3*d^4*g*i^2)*B^2*x^3
+ 6*(b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^2)*B^2*x^2)*log((b*x + a)^n)^2 +
 (3*B^2*b^4*d^4*g*i^2*x^4 + 12*B^2*a*b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g
*i^2 + a*b^3*d^4*g*i^2)*B^2*x^3 + 6*(b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^
2)*B^2*x^2)*log((d*x + c)^n)^2 + (6*B^2*b^4*d^4*g*i^2*x^4*log(e) - 2*((g*i^
2*n - 8*g*i^2*log(e))*b^4*c*d^3 - (g*i^2*n + 4*g*i^2*log(e))*a*b^3*d^4)*B^2
*x^3 + (a^2*b^2*d^4*g*i^2*n - (5*g*i^2*n - 12*g*i^2*log(e))*b^4*c^2*d^2 + 4
*(g*i^2*n + 6*g*i^2*log(e))*a*b^3*c*d^3)*B^2*x^2 - 2*(b^4*c^3*d*g*i^2*n - 4
*a^2*b^2*c*d^3*g*i^2*n + a^3*b*d^4*g*i^2*n + 2*(g*i^2*n - 6*g*i^2*log(e))*a
*b^3*c^2*d^2)*B^2*x + 2*(6*a^2*b^2*c^2*d^2*g*i^2*n - 4*a^3*b*c*d^3*g*i^2*n
+ a^4*d^4*g*i^2*n)*B^2*log(b*x + a) + 2*(b^4*c^4*g*i^2*n - 4*a*b^3*c^3*d*g*
i^2*n)*B^2*log(d*x + c))*log((b*x + a)^n) - (6*B^2*b^4*d^4*g*i^2*x^4*log(e)
 - 2*((g*i^2*n - 8*g*i^2*log(e))*b^4*c*d^3 - (g*i^2*n + 4*g*i^2*log(e))*a*b
^3*d^4)*B^2*x^3 + (a^2*b^2*d^4*g*i^2*n - (5*g*i^2*n - 12*g*i^2*log(e))*b^4*
c^2*d^2 + 4*(g*i^2*n + 6*g*i^2*log(e))*a*b^3*c*d^3)*B^2*x^2 - 2*(b^4*c^3*d*
g*i^2*n - 4*a^2*b^2*c*d^3*g*i^2*n + a^3*b*d^4*g*i^2*n + 2*(g*i^2*n - 6*g*i^
2*log(e))*a*b^3*c^2*d^2)*B^2*x + 2*(6*a^2*b^2*c^2*d^2*g*i^2*n - 4*a^3*b*c*d
^3*g*i^2*n + a^4*d^4*g*i^2*n)*B^2*log(b*x + a) + 2*(b^4*c^4*g*i^2*n - 4*a*b
^3*c^3*d*g*i^2*n)*B^2*log(d*x + c) + 2*(3*B^2*b^4*d^4*g*i^2*x^4 + 12*B^2*a*
b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g*i^2 + a*b^3*d^4*g*i^2)*B^2*x^3 + 6*(
b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^2)*B^2*x^2)*log((b*x + a)^n))*log((d*
x + c)^n))/(b^3*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bd^2gi^2x^3 + A^2ac^2gi^2 + \left(2\,A^2bcd + A^2ad^2\right)gi^2x^2 + \left(A^2bc^2 + 2\,A^2acd\right)gi^2x + \left(B^2bd^2gi^2x^3 + B^2ac^2gi^2 + \left(2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] integral(A^2*b*d^2*g*i^2*x^3 + A^2*a*c^2*g*i^2 + (2*A^2*b*c*d + A^2*a*d^2)*
g*i^2*x^2 + (A^2*b*c^2 + 2*A^2*a*c*d)*g*i^2*x + (B^2*b*d^2*g*i^2*x^3 + B^2*
a*c^2*g*i^2 + (2*B^2*b*c*d + B^2*a*d^2)*g*i^2*x^2 + (B^2*b*c^2 + 2*B^2*a*c*
d)*g*i^2*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b*d^2*g*i^2*x^3 + A*B
*a*c^2*g*i^2 + (2*A*B*b*c*d + A*B*a*d^2)*g*i^2*x^2 + (A*B*b*c^2 + 2*A*B*a*c
*d)*g*i^2*x)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)(dix+ci)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) +
 A)^2, x)
```

3.171 $\int (ci+dix)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=361

$$-\frac{2B^2i^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{3b^3d}+\frac{2Bi^2n(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d}-\frac{2Bi^2n(a+bx)(}{}$$

```
[Out] (B^2*(b*c - a*d)^2*i^2*n^2*x)/(3*b^2) - (2*B*(b*c - a*d)^2*i^2*n*(a + b*x)*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3) - (B*(b*c - a*d)*i^2*n*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*d) + (i^2*(c + d*x)^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*d) + (B^2*(b*c - a*d)^3*i^2*n^
2*Log[(a + b*x)/(c + d*x)])/(3*b^3*d) + (B^2*(b*c - a*d)^3*i^2*n^2*Log[c +
d*x])/(b^3*d) + (2*B*(b*c - a*d)^3*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3
*i^2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d)
```

Rubi [A] time = 0.543237, antiderivative size = 454, normalized size of antiderivative = 1.26, number of steps used = 19, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{2B^2i^2n^2(bc-ad)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3d}-\frac{2Bi^2n(bc-ad)^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d}-\frac{2ABi^2nx(bc-ad)}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^2*i^2*n*x)/(3*b^2) + (B^2*(b*c - a*d)^2*i^2*n^2*x)/(3*b
^2) + (B^2*(b*c - a*d)^3*i^2*n^2*Log[a + b*x])/(3*b^3*d) + (B^2*(b*c - a*d)
^3*i^2*n^2*Log[a + b*x]^2)/(3*b^3*d) - (2*B^2*(b*c - a*d)^2*i^2*n*(a + b*x)
*Log[e*((a + b*x)/(c + d*x))^n])/(3*b^3) - (B*(b*c - a*d)*i^2*n*(c + d*x)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*d) - (2*B*(b*c - a*d)^3*i^2*n
*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3*d) + (i^2*(c +
 d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*d) + (2*B^2*(b*c - a*d
)^3*i^2*n^2*Log[c + d*x])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*n^2*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*n
^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (171c+171dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(2Bn)\int \frac{5000211(bc-ad)(c\cdots}{51\cdots}}{\cdots}$$

$$= \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(19494B(bc-ad)n)\int \cdots}{\cdots}$$

$$= \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(19494B(bc-ad)n)\int \cdots}{\cdots}$$

$$= \frac{9747(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d} - \frac{(19494B(bc-ad)n)\int (\cdots}{\cdots}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{9747B(bc-ad)n(c+dx)^2\left(A+B\log\left(\cdots\right.\right.}{bd}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{19494B^2(bc-ad)^2n(a+bx)\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.}{b^3}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{19494B^2(bc-ad)^2n(a+bx)\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.}{b^3}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2} + \frac{9747B^2(bc-\cdots}{\cdots}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2} + \frac{9747B^2(bc-\cdots}{\cdots}$$

$$= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2} + \frac{9747B^2(bc-\cdots}{\cdots}$$

Mathematica [A] time = 0.238118, size = 303, normalized size = 0.84

$$\frac{i^2\left((c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn(bc-ad)\left(-Bn(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+b^2(c+dx)^2\left(B\,\mathrm{l}\cdots\right.}{\cdots}\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (i^2*((c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*
x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[a + b*
x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c + d*x
] - B*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*
c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3))/(3*d)
```

Maple [F] time = 0.527, size = 0, normalized size = 0.

$$\int (dix+ci)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.69403, size = 1989, normalized size = 5.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/3*A*B*d^2*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*d^2*i^
2*x^3 + 2*A*B*c*d*i^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*d*
i^2*x^2 + 1/3*A*B*d^2*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*
c*d*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d
)) + 2*A*B*c^2*i^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*c^2*i^2*
x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c^2*i^2*x - 1/3*(5*a*b*c^2*d
*i^2*n^2 - 2*a^2*c*d^2*i^2*n^2 - (3*i^2*n^2 - 2*i^2*n*log(e))*b^2*c^3)*B^2*
log(d*x + c)/(b^2*d) - 2/3*(b^3*c^3*i^2*n^2 - 3*a*b^2*c^2*d*i^2*n^2 + 3*a^2
*b*c*d^2*i^2*n^2 - a^3*d^3*i^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d) + 1/3*(B^2*b^3*d
^3*i^2*x^3*log(e)^2 + 2*B^2*b^3*c^3*i^2*n^2*log(b*x + a)*log(d*x + c) - B^2
*b^3*c^3*i^2*n^2*log(d*x + c)^2 + (a*b^2*d^3*i^2*n*log(e) - (i^2*n*log(e) -
 3*i^2*log(e)^2)*b^3*c*d^2)*B^2*x^2 - (3*a*b^2*c^2*d*i^2*n^2 - 3*a^2*b*c*d^
2*i^2*n^2 + a^3*d^3*i^2*n^2)*B^2*log(b*x + a)^2 + ((i^2*n^2 - 4*i^2*n*log(e
) + 3*i^2*log(e)^2)*b^3*c^2*d - 2*(i^2*n^2 - 3*i^2*n*log(e))*a*b^2*c*d^2 +
(i^2*n^2 - 2*i^2*n*log(e))*a^2*b*d^3)*B^2*x - (2*(2*i^2*n^2 - 3*i^2*n*log(e
))*a*b^2*c^2*d - (7*i^2*n^2 - 6*i^2*n*log(e))*a^2*b*c*d^2 + (3*i^2*n^2 - 2*
i^2*n*log(e))*a^3*d^3)*B^2*log(b*x + a) + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*
c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*i^
2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x)*log((d*x + c)^n)^2
 + (2*B^2*b^3*d^3*i^2*x^3*log(e) - 2*B^2*b^3*c^3*i^2*n*log(d*x + c) + (a*b^
2*d^3*i^2*n - (i^2*n - 6*i^2*log(e))*b^3*c*d^2)*B^2*x^2 + 2*(3*a*b^2*c*d^2*
i^2*n - a^2*b*d^3*i^2*n - (2*i^2*n - 3*i^2*log(e))*b^3*c^2*d)*B^2*x + 2*(3*
```

```
a*b^2*c^2*d*i^2*n - 3*a^2*b*c*d^2*i^2*n + a^3*d^3*i^2*n)*B^2*log(b*x + a))*
log((b*x + a)^n) - (2*B^2*b^3*d^3*i^2*x^3*log(e) - 2*B^2*b^3*c^3*i^2*n*log(
d*x + c) + (a*b^2*d^3*i^2*n - (i^2*n - 6*i^2*log(e))*b^3*c*d^2)*B^2*x^2 + 2
*(3*a*b^2*c*d^2*i^2*n - a^2*b*d^3*i^2*n - (2*i^2*n - 3*i^2*log(e))*b^3*c^2*
d)*B^2*x + 2*(3*a*b^2*c^2*d*i^2*n - 3*a^2*b*c*d^2*i^2*n + a^3*d^3*i^2*n)*B^
2*log(b*x + a) + 2*(B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b
^3*c^2*d*i^2*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABd^2i^2x^2 + 2\,AB\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^2
 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B
*d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n
), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dix+ci)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.172 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=572

$$\frac{2Bi^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g}+\frac{2B^2i^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g}-\frac{B^2i^2n^2(bc-ad)}{}$$

```
[Out] -((B*d*(b*c - a*d)*i^2*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^3*g)) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)
/(2*b*g) + (2*B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*
Log[(b*c - a*d)/(b*(c + d*x))])/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*n^2*Log[c
+ d*x])/(b^3*g) + (B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) - ((b*c - a*d)^2*i^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])
/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*
x))])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))])/(b^3*g) + (2*B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c - a*
d)^2*i^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g)
```

Rubi [B] time = 5.08149, antiderivative size = 1790, normalized size of antiderivative = 3.13, number of steps used = 82, number of rules used = 27, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
),x]
```

```
[Out] -((A*B*d*(b*c - a*d)*i^2*n*x)/(b^2*g)) - (a*B^2*d*(b*c - a*d)*i^2*n^2*Log[a
 + b*x]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*n^2*Log[a + b*x]^2)/(2*b^3*g) -
 (A*B*(b*c - a*d)^2*i^2*n*Log[g*(a + b*x)]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*
i^2*n^2*Log[g*(a + b*x)]^3)/(3*b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2*Log[g*(a
 + b*x)]^2*Log[-c - d*x])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n*Log[g*(a + b
*x)]*Log[(a + b*x)^n]*Log[-c - d*x])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[(
a + b*x)^n]^2*Log[-c - d*x])/(b^3*g) - (B^2*d*(b*c - a*d)*i^2*n*(a + b*x)*L
og[e*((a + b*x)/(c + d*x))^n])/(b^3*g) + (2*a*B*d*(b*c - a*d)*i^2*n*Log[a +
 b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g) - (B*(b*c - a*d)^2*i^
2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g) + (d*(b*c
- a*d)*i^2*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g) + (i^2*(c +
d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b*g) + (B^2*(b*c - a*d)
^2*i^2*n^2*Log[c + d*x])/(b^3*g) + (2*B^2*c*(b*c - a*d)*i^2*n^2*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*g) - (2*B*c*(b*c - a*d)*i^2*n*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^2*g) - (B^2*c*(b*c - a
*d)*i^2*n^2*Log[c + d*x]^2)/(b^2*g) + (2*a*B^2*d*(b*c - a*d)*i^2*n^2*Log[a
+ b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g) + (B^2*(b*c - a*d)^2*
i^2*n^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g) + (B^2*(
b*c - a*d)^2*i^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g)
```

```
 + (B^2*(b*c - a*d)^2*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(
-n)]^2)/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[g*(a + b*x)]*Log[(c + d*x)^(-n
)]^2)/(b^3*g) + ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
*Log[a*g + b*g*x])/(b^3*g) + (2*A*B*(b*c - a*d)^2*i^2*n*Log[(b*(c + d*x))/(
b*c - a*d)]*Log[a*g + b*g*x])/(b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*n*Log[(b*(
c + d*x))/(b*c - a*d)]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] +
 Log[(c + d*x)^(-n)])*Log[a*g + b*g*x])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*n*
Log[e*((a + b*x)/(c + d*x))^n]*Log[a*g + b*g*x]^2)/(b^3*g) - (B^2*(b*c - a*
d)^2*i^2*n^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b^3*g) + (
2*A*B*(b*c - a*d)^2*i^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g)
 + (2*a*B^2*d*(b*c - a*d)*i^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])
/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*
(a + b*x))/(b*c - a*d))])/(b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*n*(Log[(a + b*
x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(b^3*g) + (2*B^2*c*(b*c - a*d)*i^2*n^2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*g) - (2*B^2*(b*c - a*d)^2*i^2*n*Log[(c
 + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g) - (2*B^2*(b*c
- a*d)^2*i^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g) - (2*B^2
*(b*c - a*d)^2*i^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(b^3*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
```

```
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rubi steps

$$\int \frac{(172c+172dx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx = \int \left(\frac{29584d(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{172d(172c+172d\cdots}{\cdots} \right.$$

$$= \frac{\left(29584(bc-ad)^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx}{b^2} + \frac{(172d)\int(172c+172d\cdots}{\cdots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+dx)^2\left(A+\cdots\right.}{bg\cdots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+dx)^2\left(A+\cdots\right.}{bg\cdots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+dx)^2\left(A+\cdots\right.}{bg\cdots}$$

$$= \frac{29584d(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g} + \frac{14792(c+dx)^2\left(A+\cdots\right.}{bg\cdots}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} + \frac{59168aBd(bc-ad)n\log(a+bx)\left(A+B\cdots\right.}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584B^2d(bc-ad)n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584B^2d(bc-ad)n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584B^2d(bc-ad)n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{b^3g}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a+bx)}{b^3g} + \frac{1\cdots}{\cdots}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a+bx)}{b^3g} + \frac{1\cdots}{\cdots}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a+bx)}{b^3g} + \frac{1\cdots}{\cdots}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a+bx)}{b^3g} + \frac{1\cdots}{\cdots}$$

$$= -\frac{29584ABd(bc-ad)nx}{b^2g} - \frac{29584aB^2d(bc-ad)n^2\log^2(a+bx)}{b^3g} + \frac{1\cdots}{\cdots}$$

Mathematica [B] time = 3.0083, size = 1654, normalized size = 2.89

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x),x]
```

```
[Out] (i^2*(6*b*d*(2*b*c - a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])^2 + 3*b^2*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 6*(b*c - a*d)^2*Log[a + b*x]*(A + B
*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - 12*b*B*
c*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(
a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*
d + Log[c/d + x]*(b*c + a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) +
a*d)]) + (-(b*d*x) + a*d*Log[a + b*x])*Log[(a + b*x)/(c + d*x)]) - 2*a*d*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 6*b^2*B*c^2*n*(A + B*Log[e*((a + b*x
)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a +
 b*x]*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) - 2*(Log[c/d
 + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])) + 3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
 + d*x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^
2 + 4*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^
2*Log[a/b + x] - 2*a^2*Log[a + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[
a + b*x])*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) + b^2*(d
*x*(-2*c + d*x) - 2*d^2*x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*
(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])) + 4*b*B^2*c*n^2*(Log[(a + b*x)/(c + d*x)]*(-(a*d*Log[(a + b*
x)/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(
a + b*x)/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c
- a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) - B^2*n^2*(6*b^2*c^2*Lo
g[(b*c - a*d)/(c + d*x)] - 12*a*b*c*d*Log[(b*c - a*d)/(c + d*x)] + 6*a^2*d^
2*Log[(b*c - a*d)/(c + d*x)] + 6*a*b*c*d*Log[(a + b*x)/(c + d*x)] - 6*a^2*d
^2*Log[(a + b*x)/(c + d*x)] + 6*b^2*c*d*x*Log[(a + b*x)/(c + d*x)] - 6*a*b*
d^2*x*Log[(a + b*x)/(c + d*x)] + 9*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2 + 6*a
*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2 - 3*b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)
]^2 - 2*a^2*d^2*Log[(a + b*x)/(c + d*x)]^3 + 6*b^2*c^2*Log[(a + b*x)/(c + d
*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b*c*d*Log[(a + b*x)/(c + d*x)]*L
og[(b*c - a*d)/(b*c + b*d*x)] - 18*a^2*d^2*Log[(a + b*x)/(c + d*x)]*Log[(b*
c - a*d)/(b*c + b*d*x)] + 6*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a
*d)/(b*c + b*d*x)] + 6*(b^2*c^2 + 2*a*b*c*d - 3*a^2*d^2 + 2*a^2*d^2*Log[(a
+ b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*d^2*Pol
yLog[3, (d*(a + b*x))/(b*(c + d*x))]) - 6*b^2*B^2*c^2*n^2*(Log[(-(b*c) + a*
d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - 2*Log[(a + b*x)/(c + d*x)]*P
olyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*PolyLog[3, (b*(c + d*x))/(d*(a +
 b*x))])))/(6*b^3*g)
```

Maple [F] time = 0.687, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{bgx + ag} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="maxima")
```

```
[Out] 2*A^2*c*d*i^2*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/2*A^2*d^2*i^2*(2*a^2*l
og(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A^2*c^2*i^2*log(b*g*x + a*
g)/(b*g) + 1/2*(B^2*b^2*d^2*i^2*x^2 + 2*(2*b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x
 + 2*(b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B^2*log(b*x + a))*log((d*x
 + c)^n)^2/(b^3*g) - integrate(-(B^2*b^3*c^3*i^2*log(e)^2 + 2*A*B*b^3*c^3*i
^2*log(e) + (B^2*b^3*d^3*i^2*log(e)^2 + 2*A*B*b^3*d^3*i^2*log(e))*x^3 + 3*(
B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A*B*b^3*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*d^3
*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^
2)*log((b*x + a)^n)^2 + 3*(B^2*b^3*c^2*d*i^2*log(e)^2 + 2*A*B*b^3*c^2*d*i^2
*log(e))*x + 2*(B^2*b^3*c^3*i^2*log(e) + A*B*b^3*c^3*i^2 + (B^2*b^3*d^3*i^2
*log(e) + A*B*b^3*d^3*i^2)*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e) + A*B*b^3*c*d^
2*i^2)*x^2 + 3*(B^2*b^3*c^2*d*i^2*log(e) + A*B*b^3*c^2*d*i^2)*x)*log((b*x +
 a)^n) - (2*B^2*b^3*c^3*i^2*log(e) + 2*A*B*b^3*c^3*i^2 + (2*A*B*b^3*d^3*i^2
 + (i^2*n + 2*i^2*log(e))*B^2*b^3*d^3)*x^3 + (6*A*B*b^3*c*d^2*i^2 - (a*b^2*
d^3*i^2*n - 2*(2*i^2*n + 3*i^2*log(e))*b^3*c*d^2)*B^2)*x^2 + 2*(3*A*B*b^3*c
^2*d*i^2 + (2*a*b^2*c*d^2*i^2*n - a^2*b*d^3*i^2*n + 3*b^3*c^2*d*i^2*log(e))
*B^2)*x + 2*((b^3*c^2*d*i^2*n - 2*a*b^2*c*d^2*i^2*n + a^2*b*d^3*i^2*n)*B^2*
x + (a*b^2*c^2*d*i^2*n - 2*a^2*b*c*d^2*i^2*n + a^3*d^3*i^2*n)*B^2)*log(b*x
+ a) + 2*(B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i
^2*x + B^2*b^3*c^3*i^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^4*d*g*x^2 +
a*b^3*c*g + (b^4*c*g + a*b^3*d*g)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABd^2i^2x^2 + 2\,ABcd\right.}{bgx + ag}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^
2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*
B*d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^
n))/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g), x)
```

3.173 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=472

$$\frac{4Bdi^2n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^2}+\frac{2B^2di^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^3g^2}+\frac{4B^2di^2n^2(b\cdots}{}$$

```
[Out] (-2*B^2*(b*c - a*d)*i^2*n^2*(c + d*x))/(b^2*g^2*(a + b*x)) - (2*B*(b*c - a*
d)*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2*(a + b*
x)) + (d^2*i^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2
) - ((b*c - a*d)*i^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b
^2*g^2*(a + b*x)) + (2*B*d*(b*c - a*d)*i^2*n*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(b^3*g^2) - (2*d*(b*c - a*d)*i^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))
])/(b^3*g^2) + (2*B^2*d*(b*c - a*d)*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))])/(b^3*g^2) + (4*B*d*(b*c - a*d)*i^2*n*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (4*B^2*d*(b
*c - a*d)*i^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2)
```

Rubi [B] time = 3.76458, antiderivative size = 1309, normalized size of antiderivative = 2.77, number of steps used = 60, number of rules used = 21, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$-\frac{aB^2d^2n^2\log^2(a+bx)i^2}{b^3g^2}+\frac{B^2d(bc-ad)n^2\log^2(a+bx)i^2}{b^3g^2}-\frac{2ABd(bc-ad)n\log^2(a+bx)i^2}{b^3g^2}-\frac{2B^2d(bc-ad)\log\left(-\frac{bc\cdots}{d(a\cdots}\right.}{b^3\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^2*n^2)/(b^3*g^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)*i
^2*n^2*Log[a + b*x])/(b^3*g^2) - (2*A*B*d*(b*c - a*d)*i^2*n*Log[a + b*x]^2)
/(b^3*g^2) - (a*B^2*d^2*i^2*n^2*Log[a + b*x]^2)/(b^3*g^2) + (B^2*d*(b*c - a
*d)*i^2*n^2*Log[a + b*x]^2)/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*Log[-((b*c
 - a*d)/(d*(a + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^2) - (2*B^
2*d*(b*c - a*d)*i^2*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^2
) - (2*B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g
^2*(a + b*x)) + (2*a*B*d^2*i^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(b^3*g^2) - (2*B*d*(b*c - a*d)*i^2*n*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(b^3*g^2) + (d^2*i^2*x*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2)/(b^2*g^2) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(b^3*g^2*(a + b*x)) + (2*d*(b*c - a*d)*i^2*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2) + (2*B^2*d*(b*c - a*d)*i^2*n
^2*Log[c + d*x])/(b^3*g^2) + (2*B^2*c*d*i^2*n^2*Log[-((d*(a + b*x))/(b*c -
a*d))]*Log[c + d*x])/(b^2*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*Log[-((d*(a +
 b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^2) - (2*B*c*d*i^2*n*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^2*g^2) + (2*B*d*(b*c - a*d)*i^2*
n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^3*g^2) - (B^2*c*d
*i^2*n^2*Log[c + d*x]^2)/(b^2*g^2) + (B^2*d*(b*c - a*d)*i^2*n^2*Log[c + d*x
]^2)/(b^3*g^2) + (4*A*B*d*(b*c - a*d)*i^2*n*Log[a + b*x]*Log[(b*(c + d*x))/
```

```
(b*c - a*d)])/(b^3*g^2) + (2*a*B^2*d^2*i^2*n^2*Log[a + b*x]*Log[(b*(c + d*x
))/(b*c - a*d)])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*Log[a + b*x]*Log[
(b*(c + d*x))/(b*c - a*d)])/(b^3*g^2) + (4*A*B*d*(b*c - a*d)*i^2*n*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^2) + (2*a*B^2*d^2*i^2*n^2*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^2) + (2*B^2*c*d*i^2*n^2*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n
^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*
i^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x
))])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d
*(a + b*x))])/(b^3*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(173c+173dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx = \int\left(\frac{29929d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} + \frac{29929(bc-ad)^2\left(A+B\,\mathrm{lo}\cdots\right.}{b^2g^2(a+bx\cdots}\right.$$

$$= \frac{\left(29929d^2\right)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx}{b^2g^2} + \frac{(59858d(bc-ad))\int\cdots}{b^2g^2\cdots}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2\left(A+B\log\cdots\right.}{b^3g^2(a+bx)}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2\left(A+B\log\cdots\right.}{b^3g^2(a+bx)}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2\left(A+B\log\cdots\right.}{b^3g^2(a+bx)}$$

$$= \frac{29929d^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^2} - \frac{29929(bc-ad)^2\left(A+B\log\cdots\right.}{b^3g^2(a+bx)}$$

$$= -\frac{59858B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^2(a+bx)} + \frac{59858aBd^2n\log(a\cdots}{\cdots}$$

$$= -\frac{59858B^2d(bc-ad)\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2} - \frac{59858B(bc-a\cdots}{\cdots}$$

$$= -\frac{59858B^2d(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^2} - \frac{59858B^2d(b\cdots}{\cdots}$$

$$= -\frac{59858B^2(bc-ad)^2n^2}{b^3g^2(a+bx)} - \frac{59858B^2d(bc-ad)n^2\log(a+bx)}{b^3g^2} - \frac{5985\cdots}{\cdots}$$

$$= -\frac{59858B^2(bc-ad)^2n^2}{b^3g^2(a+bx)} - \frac{59858B^2d(bc-ad)n^2\log(a+bx)}{b^3g^2} - \frac{5985\cdots}{\cdots}$$

$$= -\frac{59858B^2(bc-ad)^2n^2}{b^3g^2(a+bx)} - \frac{59858B^2d(bc-ad)n^2\log(a+bx)}{b^3g^2} - \frac{5985\cdots}{\cdots}$$

Mathematica [B] time = 15.5764, size = 2834, normalized size = 6.

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^2,x]
```

```
[Out] (i^2*(3*b*d^2*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(
c + d*x)])^2 - (3*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n
*Log[(a + b*x)/(c + d*x)])^2)/(a + b*x) + 6*d*(b*c - a*d)*Log[a + b*x]*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + (6*b^
2*B*c^2*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d
*x)])*(-(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] + (b*c - a*d)*(1 + Log[(a + b*x)/(c + d*x)])))/((b*c - a*d)*(a + b*
x)) + (3*b^2*B^2*c^2*n^2*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(
b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b
*x)/(c + d*x)] - (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 + 2*d*(a + b*x)*Log
[c + d*x] - 2*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b
*d*x)] + d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
 - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[
(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c
- a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c -
 a*d)*(a + b*x)) + 6*b*B*c*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*
Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2
*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[a + b*x]*((a*d)/(b*
c - a*d) + Log[c/d + x] + Log[(a + b*x)/(c + d*x)]) + 2*a*((a + b*x)^(-1) +
 Log[(a + b*x)/(c + d*x)]/(a + b*x) + (d*Log[c + d*x])/(-(b*c) + a*d)) - 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 6*B*d^2*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*((a + b*x)*(-1 + Log[a/b + x]
) - a*Log[a/b + x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1
 + Log[c/d + x]) + (a^2*Log[c/d + x])/(a + b*x) + (b*x - a^2/(a + b*x) - 2*
a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(a + b*x)/(c + d*x)]) +
 (a^2*d*(Log[a + b*x] - Log[c + d*x]))/(-(b*c) + a*d) + 2*a*(Log[c/d + x]*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
+ (2*b*B^2*c*d*n^2*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a
+ b*x) + 6*a*d*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 -
 6*b*c*Log[c/d + x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a
/b + x]*Log[a + b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]
*Log[a + b*x] - 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d
*(a + b*x))/(-(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] - (6*b*(b*c - a*d)*x*Log[(a + b*x)/(c + d*x)])/(a + b*x) + 6*b*c*Lo
g[a + b*x]*Log[(a + b*x)/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(a + b*x)/(c +
 d*x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2 + 3*b*d*x*Log[(a + b*x)/(c + d*x)
]^2 - (3*b^2*x*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2)/(a + b*x) - 3*b*c*Log[
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - a*d*Log[(a + b*x
)/(c + d*x)]^3 + 6*b*c*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*
x)] - 6*a*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d
*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b*c - a*d +
 a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*
(b*c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 6*b*c*Log[(a + b*x)/(c
+ d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*a*d*PolyLog[3, (d*(a +
b*x))/(b*(c + d*x))] + 6*b*c*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]))/(b*c
 - a*d) - (B^2*d*n^2*(6*a^2*b*c*d + 6*a^2*b*d^2*x + 6*a^2*b*c*d*Log[(a + b*
x)/(c + d*x)] + 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)] + 12*a^2*b*c*d*Log[(
-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)] + 12*a*b^2*c*d*x*Log[
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)] + 6*a^2*b*c*d*Log[(a
 + b*x)/(c + d*x)]^2 + 3*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2 + 9*a^2*b*d^2*x
*Log[(a + b*x)/(c + d*x)]^2 - 3*b^3*c*d*x^2*Log[(a + b*x)/(c + d*x)]^2 + 3*
a*b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^2 - 6*a^2*b*c*d*Log[(-(b*c) + a*d)/(
d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - 6*a*b^2*c*d*x*Log[(-(b*c) + a*d)
/(d*(a + b*x))]*Log[(a + b*x)/(c + d*x)]^2 - 2*a^3*d^2*Log[(a + b*x)/(c + d
*x)]^3 - 2*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]^3 - 6*a*b^2*c^2*Log[(a + b*
x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a^3*d^2*Log[(a + b*x)/(c +
 d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*b^3*c^2*x*Log[(a + b*x)/(c + d*x)
]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]*L
og[(b*c - a*d)/(b*c + b*d*x)] + 6*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b
```

```
*c - a*d)/(b*c + b*d*x)] + 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2*Log[(b*
c - a*d)/(b*c + b*d*x)] + 6*(a + b*x)*(-(b^2*c^2) - a^2*d^2 + 2*a^2*d^2*Log
[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + 12*a*b*c*d
*(a + b*x)*(-1 + Log[(a + b*x)/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))] - 12*a^3*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*b*d^2
*x*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 12*a^2*b*c*d*PolyLog[3, (b*(c
+ d*x))/(d*(a + b*x))] + 12*a*b^2*c*d*x*PolyLog[3, (b*(c + d*x))/(d*(a + b*
x))]))/((b*c - a*d)*(a + b*x))))/(3*b^3*g^2)
```

Maple [F] time = 0.714, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{(bgx+ag)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="maxima")
```

```
[Out] -2*A*B*c^2*i^2*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)
*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - A^2*(a^2/(b^4*g^2*x + a*b^3
*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*d^2*i^2 + 2*A^2*c*d*i^2*(
a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - 2*A*B*c^2*i^2*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n)/(b^2*g^2*x + a*b*g^2) - A^2*c^2*i^2/(b^2*g^
2*x + a*b*g^2) + (B^2*b^2*d^2*i^2*x^2 + B^2*a*b*d^2*i^2*x - (b^2*c^2*i^2 -
2*a*b*c*d*i^2 + a^2*d^2*i^2)*B^2 + 2*((b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + (
a*b*c*d*i^2 - a^2*d^2*i^2)*B^2)*log(b*x + a))*log((d*x + c)^n)^2/(b^4*g^2*x
 + a*b^3*g^2) - integrate(-(B^2*b^3*c^3*i^2*log(e)^2 + (B^2*b^3*d^3*i^2*log
(e)^2 + 2*A*B*b^3*d^3*i^2*log(e))*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A
*B*b^3*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x
^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log((b*x + a)^n)^2 + (3*B^2*b
^3*c^2*d*i^2*log(e)^2 + 4*A*B*b^3*c^2*d*i^2*log(e))*x + 2*(B^2*b^3*c^3*i^2*
log(e) + (B^2*b^3*d^3*i^2*log(e) + A*B*b^3*d^3*i^2)*x^3 + 3*(B^2*b^3*c*d^2*
i^2*log(e) + A*B*b^3*c*d^2*i^2)*x^2 + (3*B^2*b^3*c^2*d*i^2*log(e) + 2*A*B*b
^3*c^2*d*i^2)*x)*log((b*x + a)^n) - 2*((A*B*b^3*d^3*i^2 + (i^2*n + i^2*log(
e))*B^2*b^3*d^3)*x^3 - (a*b^2*c^2*d*i^2*n - 2*a^2*b*c*d^2*i^2*n + a^3*d^3*i
^2*n - b^3*c^3*i^2*log(e))*B^2 + (3*A*B*b^3*c*d^2*i^2 + (2*a*b^2*d^3*i^2*n
+ 3*b^3*c*d^2*i^2*log(e))*B^2)*x^2 + (2*A*B*b^3*c^2*d*i^2 + (2*a*b^2*c*d^2*
i^2*n - (i^2*n - 3*i^2*log(e))*b^3*c^2*d)*B^2)*x + 2*((b^3*c*d^2*i^2*n - a*
b^2*d^3*i^2*n)*B^2*x^2 + 2*(a*b^2*c*d^2*i^2*n - a^2*b*d^3*i^2*n)*B^2*x + (a
^2*b*c*d^2*i^2*n - a^3*d^3*i^2*n)*B^2)*log(b*x + a) + (B^2*b^3*d^3*i^2*x^3
+ 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log((b
*x + a)^n))*log((d*x + c)^n))/(b^5*d*g^2*x^3 + a^2*b^3*c*g^2 + (b^5*c*g^2 +
```

```
2*a*b^4*d*g^2)*x^2 + (2*a*b^4*c*g^2 + a^2*b^3*d*g^2)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABd^2i^2x^2 + 2\,ABcdi^2x\right.}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^
2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*
B*d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^
n))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{\left(bgx + ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^2, x)
```

3.174 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=417

$$\frac{2Bd^2i^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^3g^3}+\frac{2B^2d^2i^2n^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3}-\frac{d^2i^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\right.}{b^3g^3}$$

```
[Out] (-2*B^2*d*i^2*n^2*(c + d*x))/(b^2*g^3*(a + b*x)) - (B^2*i^2*n^2*(c + d*x)^2
)/(4*b*g^3*(a + b*x)^2) - (2*B*d*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(b^2*g^3*(a + b*x)) - (B*i^2*n*(c + d*x)^2*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(2*b*g^3*(a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b*g^3*(a + b*x)^2) - (d^2*i^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b
^3*g^3) + (2*B*d^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (2*B^2*d^2*i^2*n^2*PolyLog[3, (b*
(c + d*x))/(d*(a + b*x))])/(b^3*g^3)
```

Rubi [B] time = 3.84122, antiderivative size = 1003, normalized size of antiderivative = 2.41, number of steps used = 68, number of rules used = 20, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{3B^2d^2n^2\log^2(a+bx)i^2}{2b^3g^3}-\frac{ABd^2n\log^2(a+bx)i^2}{b^3g^3}-\frac{B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)i^2}{b^3g^3}-\frac{B^2d^2\log(a+bx)\log^2\left(e\left(\right.\right.}{b^3g^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^3,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*i^2*n^2)/(4*b^3*g^3*(a + b*x)^2) - (5*B^2*d*(b*c - a*d)
*i^2*n^2)/(2*b^3*g^3*(a + b*x)) - (5*B^2*d^2*i^2*n^2*Log[a + b*x])/(2*b^3*g
^3) - (A*B*d^2*i^2*n*Log[a + b*x]^2)/(b^3*g^3) + (3*B^2*d^2*i^2*n^2*Log[a +
 b*x]^2)/(2*b^3*g^3) - (B^2*d^2*i^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e
*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^3) - (B^2*d^2*i^2*Log[a + b*x]*Log[e*((
a + b*x)/(c + d*x))^n]^2)/(b^3*g^3) - (B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(2*b^3*g^3*(a + b*x)^2) - (3*B*d*(b*c - a*d)*i^2*
n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3*(a + b*x)) - (3*B*d^2*i^
2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3) - ((b*c
- a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^3*g^3*(a + b*x)
^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g
^3*(a + b*x)) + (d^2*i^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(b^3*g^3) + (5*B^2*d^2*i^2*n^2*Log[c + d*x])/(2*b^3*g^3) - (3*B^2*d^2*
i^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^3) + (3*B*d^
2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^3*g^3) + (3
*B^2*d^2*i^2*n^2*Log[c + d*x]^2)/(2*b^3*g^3) + (2*A*B*d^2*i^2*n*Log[a + b*x
]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) - (3*B^2*d^2*i^2*n^2*Log[a + b*
x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) + (2*A*B*d^2*i^2*n*PolyLog[2,
-((d*(a + b*x))/(b*c - a*d))])/(b^3*g^3) - (3*B^2*d^2*i^2*n^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(b^3*g^3) - (3*B^2*d^2*i^2*n^2*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])/(b^3*g^3) + (2*B^2*d^2*i^2*n*Log[e*((a + b*x)/(c +
```

```
d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^3) + (2*B^2*d^2*
i^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
```

```
EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(174c+174dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx = \int\left(\frac{30276(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^3(a+bx)^3}+\frac{60552d(bc-ad)\left(\right.}{b^2g^3}\right.$$

$$=\frac{(30276d^2)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}dx}{b^2g^3}+\frac{(60552d(bc-ad))\int\frac{\left(A+B\log\left(\right.\right.}{(a+}}{b^2g^3}$$

$$=-\frac{15138(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2}-\frac{60552d(bc-ad)\left(A\right.}{b^3g^3(a}$$

$$=-\frac{15138(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2}-\frac{60552d(bc-ad)\left(A\right.}{b^3g^3(a}$$

$$=-\frac{15138(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2}-\frac{60552d(bc-ad)\left(A\right.}{b^3g^3(a}$$

$$=-\frac{15138(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3(a+bx)^2}-\frac{60552d(bc-ad)\left(A\right.}{b^3g^3(a}$$

$$=-\frac{15138B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^3(a+bx)^2}-\frac{90828Bd(bc-ad)n}{b^3g}$$

$$=-\frac{30276B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^3}-\frac{15138B(bc-ad)^2n\left(A\right.}{b^3g^3(a+}$$

$$=-\frac{30276B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^3g^3}-\frac{30276B^2d^2\log(a+b}{b^3g}$$

$$=-\frac{7569B^2(bc-ad)^2n^2}{b^3g^3(a+bx)^2}-\frac{75690B^2d(bc-ad)n^2}{b^3g^3(a+bx)}-\frac{75690B^2d^2n^2\log(}{b^3g^3}$$

$$=-\frac{7569B^2(bc-ad)^2n^2}{b^3g^3(a+bx)^2}-\frac{75690B^2d(bc-ad)n^2}{b^3g^3(a+bx)}-\frac{75690B^2d^2n^2\log(}{b^3g^3}$$

$$=-\frac{7569B^2(bc-ad)^2n^2}{b^3g^3(a+bx)^2}-\frac{75690B^2d(bc-ad)n^2}{b^3g^3(a+bx)}-\frac{75690B^2d^2n^2\log(}{b^3g^3}$$

Mathematica [B] time = 14.4021, size = 4761, normalized size = 11.42

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^3,x]
```

```
[Out] (d^2*i^2*Log[a + b*x]*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b
*x)/(c + d*x)]))^2)/(b^3*g^3) + (2*(-(A^2*b*c*d*i^2) + a*A^2*d^2*i^2 - 2*A*
b*B*c*d*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) +
 2*a*A*B*d^2*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x
)]) - b*B^2*c*d*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c +
d*x)])^2 + a*B^2*d^2*i^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/
(c + d*x)])^2))/(b^3*g^3*(a + b*x)) + (-(A^2*b^2*c^2*i^2) + 2*a*A^2*b*c*d*i
^2 - a^2*A^2*d^2*i^2 - 2*A*b^2*B*c^2*i^2*(Log[e*((a + b*x)/(c + d*x))^n] -
n*Log[(a + b*x)/(c + d*x)]) + 4*a*A*b*B*c*d*i^2*(Log[e*((a + b*x)/(c + d*x)
)^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*a^2*A*B*d^2*i^2*(Log[e*((a + b*x)/(c
 + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - b^2*B^2*c^2*i^2*(Log[e*((a + b*
x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2 + 2*a*b*B^2*c*d*i^2*(Log[e
*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2 - a^2*B^2*d^2*i^2
*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/(2*b^3*g^
3*(a + b*x)^2) + (2*B*c^2*i^2*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*
Log[(a + b*x)/(c + d*x)]))*(-((a/b + x)*(2*Log[a/b + x] + 4*Log[a/b + x]^2)
)/(8*(a + b*x)^3*Log[a/b + x]) - ((b*(c/d + x))/((-a + (b*c)/d)^3*(1 - (b*(
c/d + x))/(-a + (b*c)/d))) - ((b^2*(c/d + x)^2)/((-a + (b*c)/d)^4*(1 - (b*(
c/d + x))/(-a + (b*c)/d))^2) + (2*b*(c/d + x))/((-a + (b*c)/d)^3*(1 - (b*(c
/d + x))/(-a + (b*c)/d))))*Log[c/d + x] - Log[1 - (b*(c/d + x))/(-a + (b*c)
/d)]/(-a + (b*c)/d)^2)/(2*b) - (-Log[a/b + x] + Log[c/d + x] + Log[a/(c + d
*x) + (b*x)/(c + d*x)])/(2*b*(a + b*x)^2)))/g^3 + (4*B*c*d*i^2*n*(A + B*(Lo
g[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))*(-((1 + Log[a/b
 + x])/(b^2*(a + b*x))) + (a*(1 + 2*Log[a/b + x]))/(4*b^2*(a + b*x)^2) - (-
(Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/
(b*c - a*d)))/b)/b - (a*(Log[c/d + x] + (d*(a + b*x)*(b*c - a*d + d*(a + b*
x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]))/(b*c - a*d)^2))/(2*b^2*(a + b*
x)^2) - ((a + 2*b*x)*(-Log[a/b + x] + Log[c/d + x] + Log[a/(c + d*x) + (b*x
)/(c + d*x)]))/(2*b^2*(a + b*x)^2)))/g^3 + (2*B*d^2*i^2*n*(A + B*(Log[e*((a
 + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))*(Log[a/b + x]^2/(2*b^3
) + (2*a*(1 + Log[a/b + x]))/(b^3*(a + b*x)) - (a^2*(1 + 2*Log[a/b + x]))/(
4*b^3*(a + b*x)^2) + (2*a*(-(Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a + b*x]
/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b))/b^2 + (a^2*(Log[c/d + x] + (d
*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]
))/(b*c - a*d)^2))/(2*b^3*(a + b*x)^2) + (((a*(3*a + 4*b*x))/(a + b*x)^2 +
2*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[a/(c + d*x) + (b*x)/(c
+ d*x)]))/(2*b^3) - ((Log[c/d + x]*Log[(a + b*x)/(a - (b*c)/d)])/b + PolyLo
g[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2))/g^3 + (B^2*c*d*i^2*n^2*(2*a*Log[
(a + b*x)/(c + d*x)]^2 - 4*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 - (4*(a + b
*x)*(2*b*c - 2*a*d + 2*d*(a + b*x)*Log[a + b*x] + 2*(b*c - a*d)*Log[(a + b*
x)/(c + d*x)] + 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*d*(
a + b*x)*Log[c + d*x] + 2*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a
*d)/(b*c + b*d*x)] - d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - d*(a
+ b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
 + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])))/(b*c - a*d) + (a*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2
*(a + b*x)^2*Log[a + b*x] + 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] + 4*d*
(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)] - 4*d^2*(a + b*x)^2*Log[a
 + b*x]*Log[(a + b*x)/(c + d*x)] + 2*d^2*(a + b*x)^2*Log[c + d*x] - 4*d*(a
+ b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) -
4*d^2*(a + b*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] +
 2*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*d^2*(a + b*x)^2*(
Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(
b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*
c - a*d)^2))/(2*b^2*g^3*(a + b*x)^2) - (B^2*c^2*i^2*n^2*((b*c - a*d)^2 + 2*
d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*(b*c - a*d)
^2*Log[(a + b*x)/(c + d*x)] + 4*d*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c
```

```
 + d*x)] - 4*d^2*(a + b*x)^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 2*(b*c
 - a*d)^2*Log[(a + b*x)/(c + d*x)]^2 + 2*d^2*(a + b*x)^2*Log[c + d*x] - 4*d
*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]
) - 4*d^2*(a + b*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x
)] + 2*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b
*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*d^2*(a + b*x)
^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + L
og[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))
/(4*b*(b*c - a*d)^2*g^3*(a + b*x)^2) - (B^2*d^2*i^2*n^2*((2*x*(7*b^2*c^2 -
14*a*b*c*d + 7*a^2*d^2 - 6*d*(a + b*x)*(a*d - b*(2*c + d*x))*Log[a + b*x] +
 6*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] + 2*b^2*(c + d*x)^2*Log[(a + b*x)
/(c + d*x)]^2 - 12*a*b*c*d*Log[c + d*x] + 6*a^2*d^2*Log[c + d*x] - 12*b^2*c
*d*x*Log[c + d*x] - 6*b^2*d^2*x^2*Log[c + d*x]))/(a + b*x) + (b*x^2*(b^2*c^
2 - 8*a*b*c*d + 7*a^2*d^2 - 6*b^2*c*d*x + 6*a*b*d^2*x - 6*d^2*(a + b*x)^2*L
og[a + b*x] + 2*(b*c - a*d)*(b*c - 3*a*d - 2*b*d*x)*Log[(a + b*x)/(c + d*x)
] + 2*b*(c + d*x)*(b*c - 2*a*d - b*d*x)*Log[(a + b*x)/(c + d*x)]^2 + 6*a^2*
d^2*Log[c + d*x] + 12*a*b*d^2*x*Log[c + d*x] + 6*b^2*d^2*x^2*Log[c + d*x]))
/(a + b*x)^2 - 2*(12*b*c^2 - 18*a*c*d + (6*a^2*d^2)/b - 3*b*c*d*x + 3*a*d^2
*x + 12*a*c*d*Log[a/b + x] - (6*a^2*d^2*Log[a/b + x])/b + 3*b*c^2*Log[a/b +
 x]^2 - 6*a*c*d*Log[a/b + x]^2 + (3*a^2*d^2*Log[a/b + x]^2)/b - 12*b*c^2*Lo
g[c/d + x] + 6*a*c*d*Log[c/d + x] + 7*b*c^2*Log[a + b*x] - 14*a*c*d*Log[a +
 b*x] + (4*a^2*d^2*Log[a + b*x])/b + 12*b*c*d*x*Log[a + b*x] - 6*a*d^2*x*Lo
g[a + b*x] + 3*b*d^2*x^2*Log[a + b*x] - 6*b*c^2*Log[a/b + x]*Log[a + b*x] +
 12*a*c*d*Log[a/b + x]*Log[a + b*x] - (6*a^2*d^2*Log[a/b + x]*Log[a + b*x])
/b + 6*b*c^2*Log[c/d + x]*Log[a + b*x] - 12*a*c*d*Log[c/d + x]*Log[a + b*x]
 + (6*a^2*d^2*Log[c/d + x]*Log[a + b*x])/b - 6*b*c^2*Log[c/d + x]*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] + 12*a*c*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c)
+ a*d)] - (6*a^2*d^2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)])/b - 2*
b*c^2*Log[(b*c - a*d)/(c + d*x)] + 4*a*c*d*Log[(b*c - a*d)/(c + d*x)] - (2*
a^2*d^2*Log[(b*c - a*d)/(c + d*x)])/b - 2*a*c*d*Log[(a + b*x)/(c + d*x)] +
(2*a^2*d^2*Log[(a + b*x)/(c + d*x)])/b - 2*b*c*d*x*Log[(a + b*x)/(c + d*x)]
 + 2*a*d^2*x*Log[(a + b*x)/(c + d*x)] + 6*b*c^2*Log[a + b*x]*Log[(a + b*x)/
(c + d*x)] - 12*a*c*d*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + (6*a^2*d^2*Lo
g[a + b*x]*Log[(a + b*x)/(c + d*x)])/b + 4*a*c*d*Log[(a + b*x)/(c + d*x)]^2
 - (3*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2)/b + 4*b*c*d*x*Log[(a + b*x)/(c +
d*x)]^2 - 2*a*d^2*x*Log[(a + b*x)/(c + d*x)]^2 + b*d^2*x^2*Log[(a + b*x)/(c
 + d*x)]^2 - 2*b*c^2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(c + d
*x)]^2 - (4*a*c*d*Log[(a + b*x)/(c + d*x)]^3)/3 + (2*a^2*d^2*Log[(a + b*x)/
(c + d*x)]^3)/(3*b) + 3*b*c^2*Log[c + d*x] - 12*b*c*d*x*Log[c + d*x] + 6*a*
d^2*x*Log[c + d*x] - 3*b*d^2*x^2*Log[c + d*x] + 6*b*c^2*Log[(a + b*x)/(c +
d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 12*a*c*d*Log[(a + b*x)/(c + d*x)]*Lo
g[(b*c - a*d)/(b*c + b*d*x)] + (6*a^2*d^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c
 - a*d)/(b*c + b*d*x)])/b + 4*a*c*d*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a
*d)/(b*c + b*d*x)] - (2*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/
(b*c + b*d*x)])/b + (2*(3*(b*c - a*d)^2 - 2*a*d*(-2*b*c + a*d)*Log[(a + b*x
)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/b - (6*(b*c - a*d)^2
*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/b + 4*b*c^2*Log[(a + b*x)/(c + d*x)
]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 8*a*c*d*PolyLog[3, (d*(a + b*x)
)/(b*(c + d*x))] + (4*a^2*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/b +
4*b*c^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])))/(4*b^2*(b*c - a*d)^2*g^3
)
```

Maple [F] time = 0.748, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{(bgx+ag)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="maxima")
```

```
[Out] -A*B*c*d*i^2*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d
)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) +
2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
*g^3)) + 1/2*A*B*c^2*i^2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*
x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*lo
g(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/(
(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) + 1/2*A^2*d^2*i^2*((4*a*b*x + 3*a
^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3))
 - 2*(2*b*x + a)*A*B*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^
3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - (2*b*x + a)*A^2*c*d*i^2/(b^4*g^3*x^2
 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - A*B*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2*c^2*i^2/(b^3*
g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*(4*(b^2*c*d*i^2 - a*b*d^2*i^2)*B
^2*x + (b^2*c^2*i^2 + 2*a*b*c*d*i^2 - 3*a^2*d^2*i^2)*B^2 - 2*(B^2*b^2*d^2*i
^2*x^2 + 2*B^2*a*b*d^2*i^2*x + B^2*a^2*d^2*i^2)*log(b*x + a))*log((d*x + c)
^n)^2/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) - integrate(-(3*B^2*b^3*c
^2*d*i^2*x*log(e)^2 + B^2*b^3*c^3*i^2*log(e)^2 + (B^2*b^3*d^3*i^2*log(e)^2
+ 2*A*B*b^3*d^3*i^2*log(e))*x^3 + (3*B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A*B*b^3
*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3
*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log((b*x + a)^n)^2 + 2*(3*B^2*b^3*c
^2*d*i^2*x*log(e) + B^2*b^3*c^3*i^2*log(e) + (B^2*b^3*d^3*i^2*log(e) + A*B*
b^3*d^3*i^2)*x^3 + (3*B^2*b^3*c*d^2*i^2*log(e) + A*B*b^3*c*d^2*i^2)*x^2)*lo
g((b*x + a)^n) + ((6*a*b^2*c*d^2*i^2*n - 7*a^2*b*d^3*i^2*n + (i^2*n - 6*i^2
*log(e))*b^3*c^2*d)*B^2*x - 2*(B^2*b^3*d^3*i^2*log(e) + A*B*b^3*d^3*i^2)*x^
3 + (a*b^2*c^2*d*i^2*n + 2*a^2*b*c*d^2*i^2*n - 3*a^3*d^3*i^2*n - 2*b^3*c^3*
i^2*log(e))*B^2 - 2*(A*B*b^3*c*d^2*i^2 + (2*a*b^2*d^3*i^2*n - (2*i^2*n - 3*
i^2*log(e))*b^3*c*d^2)*B^2)*x^2 - 2*(B^2*b^3*d^3*i^2*n*x^3 + 3*B^2*a*b^2*d^
3*i^2*n*x^2 + 3*B^2*a^2*b*d^3*i^2*n*x + B^2*a^3*d^3*i^2*n)*log(b*x + a) - 2
*(B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B
^2*b^3*c^3*i^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^6*d*g^3*x^4 + a^3*b^
3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 + a^2*b^4*d*g^3)
*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^2i^2x^2 + 2\,A^2cdi^2x + A^2c^2i^2 + \left(B^2d^2i^2x^2 + 2\,B^2cdi^2x + B^2c^2i^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABd^2i^2x^2 + 2\,ABcdi^2x\right.}{b^3g^3x^3 + 3\,ab^2g^3x^2 + 3\,a^2bg^3x + a^3g^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^
2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*
B*d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^
n))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^3, x)
```

3.175 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=157

$$-\frac{i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)}-\frac{2Bi^2n(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4(a+bx)^3(bc-ad)}-\frac{2B^2i^2n^2(c+dx)^3}{27g^4(a+bx)^3(bc-ad)}$$

```
[Out] (-2*B^2*i^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)*g^4*(a + b*x)^3) - (2*B*i^2*n*
(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)*g^4*(a +
 b*x)^3) - (i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b
*c - a*d)*g^4*(a + b*x)^3)
```

Rubi [C] time = 3.1704, antiderivative size = 889, normalized size of antiderivative = 5.66, number of steps used = 86, number of rules used = 11, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.244, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^2n^2\log^2(a+bx)d^3}{3b^3(bc-ad)g^4}+\frac{B^2i^2n^2\log^2(c+dx)d^3}{3b^3(bc-ad)g^4}-\frac{2B^2i^2n^2\log(a+bx)d^3}{9b^3(bc-ad)g^4}-\frac{2Bi^2n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^3}{3b^3(bc-ad)g^4}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^4,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^2*n^2)/(27*b^3*g^4*(a + b*x)^3) - (2*B^2*d*(b*c - a
*d)*i^2*n^2)/(9*b^3*g^4*(a + b*x)^2) - (2*B^2*d^2*i^2*n^2)/(9*b^3*g^4*(a +
b*x)) - (2*B^2*d^3*i^2*n^2*Log[a + b*x])/(9*b^3*(b*c - a*d)*g^4) + (B^2*d^3
*i^2*n^2*Log[a + b*x]^2)/(3*b^3*(b*c - a*d)*g^4) - (2*B*(b*c - a*d)^2*i^2*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*b^3*g^4*(a + b*x)^3) - (2*B*d*(
b*c - a*d)*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3*g^4*(a + b*
x)^2) - (2*B*d^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3*g^4*(
a + b*x)) - (2*B*d^3*i^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]))/(3*b^3*(b*c - a*d)*g^4) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^2)/(3*b^3*g^4*(a + b*x)^3) - (d*(b*c - a*d)*i^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])^2)/(b^3*g^4*(a + b*x)^2) - (d^2*i^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])^2)/(b^3*g^4*(a + b*x)) + (2*B^2*d^3*i^2*n^2*Log[c
 + d*x])/(9*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*n^2*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x])/(3*b^3*(b*c - a*d)*g^4) + (2*B*d^3*i^2*n*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*b^3*(b*c - a*d)*g^4) + (B^
2*d^3*i^2*n^2*Log[c + d*x]^2)/(3*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*n^2*
Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*(b*c - a*d)*g^4) - (2*B
^2*d^3*i^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*(b*c - a*d)
*g^4) - (2*B^2*d^3*i^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b^3*(b
*c - a*d)*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(175c+175dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}dx = \int \left(\frac{30625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^4(a+bx)^4} + \frac{61250d(bc-ad)\left(A+\right.}{b^2g^4(a\right.}$$

$$= \frac{\left(30625d^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2}dx}{b^2g^4} + \frac{(61250d(bc-ad))\int \frac{\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{(a+bx)^3}}{b^2g^4}$$

$$= -\frac{30625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc-ad)\left(A+B\right.}{b^3g^4(a+b}$$

$$= -\frac{30625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc-ad)\left(A+B\right.}{b^3g^4(a+b}$$

$$= -\frac{30625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc-ad)\left(A+B\right.}{b^3g^4(a+b}$$

$$= -\frac{30625(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^3g^4(a+bx)^3} - \frac{30625d(bc-ad)\left(A+B\right.}{b^3g^4(a+b}$$

$$= -\frac{61250B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^3g^4(a+bx)^3} - \frac{61250Bd(bc-ad)n\left(A\right.}{3b^3g^4(a}$$

$$= -\frac{61250B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^3g^4(a+bx)^3} - \frac{61250Bd(bc-ad)n\left(A\right.}{3b^3g^4(a}$$

$$= -\frac{61250B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^3g^4(a+bx)^3} - \frac{61250Bd(bc-ad)n\left(A\right.}{3b^3g^4(a}$$

$$= -\frac{61250B^2(bc-ad)^2n^2}{27b^3g^4(a+bx)^3} - \frac{61250B^2d(bc-ad)n^2}{9b^3g^4(a+bx)^2} - \frac{61250B^2d^2n^2}{9b^3g^4(a+bx)} - 612$$

$$= -\frac{61250B^2(bc-ad)^2n^2}{27b^3g^4(a+bx)^3} - \frac{61250B^2d(bc-ad)n^2}{9b^3g^4(a+bx)^2} - \frac{61250B^2d^2n^2}{9b^3g^4(a+bx)} - 612$$

$$= -\frac{61250B^2(bc-ad)^2n^2}{27b^3g^4(a+bx)^3} - \frac{61250B^2d(bc-ad)n^2}{9b^3g^4(a+bx)^2} - \frac{61250B^2d^2n^2}{9b^3g^4(a+bx)} - 612$$

Mathematica [C] time = 2.40232, size = 1415, normalized size = 9.01

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^4,x]
```

```
[Out] -(i^2*(18*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 54*d*(b*
c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 54*d^2*(-(b
*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 54*B*d^2*
n*(a + b*x)^2*(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d*(
a + b*x)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(a + b*x
)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*B*n*(b*c - a*d +
d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*n*(a + b*x)*(Log
[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2,
(d*(a + b*x))/(-(b*c) + a*d)]) + B*d*n*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])) + 27*B*d*n*(a + b*x)*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) + 4*d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x]
 - 4*B*d*n*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Lo
g[c + d*x]) + B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a
+ b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a + b*
x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Po
lyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*
(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])) + B*n*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x]
 + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*
x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a
 + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x])
+ 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*
(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*
x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*
n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c +
 d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(54*b^3*(b*c - a*d)*g^4
*(a + b*x)^3)
```

Maple [F] time = 0.778, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^4} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

Maxima [B] time = 3.15139, size = 7544, normalized size = 48.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="maxima")
```

```
[Out] -1/9*A*B*d^2*i^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^
2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3
*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 -
2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4
*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b
^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d +
3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^
3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*
g^4)) - 1/9*A*B*c^2*i^2*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*
d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4
*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2
 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*
b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^
2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*
b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/9*A*B*c*d*i^2*n*((5*a*b^2*c^2 - 22*a^2*b*c
*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*
d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b
^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*
c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)
 - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3
*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 -
 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/3*(3*b*x + a)*B^2
*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^5*g^4*x^3 + 3*a*b^4*g^
4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*B^
2*d^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^6*g^4*x^3 + 3*a*b^5*g
^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/54*(6*n*((6*b^2*d^2*x^2 + 2*b^2
*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*
b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2
)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*
c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*
b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^
3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3
*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 +
 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^
2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d
^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x +
a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3
*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^
3)*log(b*x + a))*log(d*x + c))*n^2/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 +
 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3
*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^
2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 -
 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*c^2*i
^2 - 1/54*(6*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*
b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*
a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d
^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^
4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x +
```

```
 a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*
b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 -
 a^3*b^2*d^3)*g^4))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (19*a*b^3*c^3
- 189*a^2*b^2*c^2*d + 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a
*b^3*c*d^2 + 5*a^2*b^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^
2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d
^2 - a^3*b*d^3)*x)*log(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*
d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c
*d^2 - a^3*b*d^3)*x)*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*
a^2*b^2*c*d^2 - 19*a^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c
*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^
2*b^2*c*d^2 - 5*a^3*b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3
+ (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2
 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b
^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*
b^2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^3*b^5*c^3*g^4
- 3*a^4*b^4*c^2*d*g^4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^
4 - 3*a*b^7*c^2*d*g^4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b
^7*c^3*g^4 - 3*a^2*b^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x
^2 + 3*(a^2*b^6*c^3*g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b
^3*d^3*g^4)*x))*B^2*c*d*i^2 - 1/54*(6*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*
a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 -
7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*
x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2
- 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b
^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c
^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d -
 3*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*
c*d^2 - a^3*b^3*d^3)*g^4))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (85*a^2
*b^3*c^3 - 108*a^3*b^2*c^2*d + 27*a^4*b*c*d^2 - 4*a^5*d^3 + 6*(18*b^5*c^3 -
 27*a*b^4*c^2*d + 11*a^2*b^3*c*d^2 - 2*a^3*b^2*d^3)*x^2 - 18*(3*a^3*b^2*c^2
*d - 3*a^4*b*c*d^2 + a^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*
x^3 + 3*(3*a*b^4*c^2*d - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*
c^2*d - 3*a^3*b^2*c*d^2 + a^4*b*d^3)*x)*log(b*x + a)^2 - 18*(3*a^3*b^2*c^2*
d - 3*a^4*b*c*d^2 + a^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*x
^3 + 3*(3*a*b^4*c^2*d - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*c
^2*d - 3*a^3*b^2*c*d^2 + a^4*b*d^3)*x)*log(d*x + c)^2 + 3*(63*a*b^4*c^3 - 8
6*a^2*b^3*c^2*d + 27*a^3*b^2*c*d^2 - 4*a^4*b*d^3)*x + 6*(18*a^3*b^2*c^2*d -
 9*a^4*b*c*d^2 + 2*a^5*d^3 + (18*b^5*c^2*d - 9*a*b^4*c*d^2 + 2*a^2*b^3*d^3)
*x^3 + 3*(18*a*b^4*c^2*d - 9*a^2*b^3*c*d^2 + 2*a^3*b^2*d^3)*x^2 + 3*(18*a^2
*b^3*c^2*d - 9*a^3*b^2*c*d^2 + 2*a^4*b*d^3)*x)*log(b*x + a) - 6*(18*a^3*b^2
*c^2*d - 9*a^4*b*c*d^2 + 2*a^5*d^3 + (18*b^5*c^2*d - 9*a*b^4*c*d^2 + 2*a^2*
b^3*d^3)*x^3 + 3*(18*a*b^4*c^2*d - 9*a^2*b^3*c*d^2 + 2*a^3*b^2*d^3)*x^2 + 3
*(18*a^2*b^3*c^2*d - 9*a^3*b^2*c*d^2 + 2*a^4*b*d^3)*x - 6*(3*a^3*b^2*c^2*d
- 3*a^4*b*c*d^2 + a^5*d^3 + (3*b^5*c^2*d - 3*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3
 + 3*(3*a*b^4*c^2*d - 3*a^2*b^3*c*d^2 + a^3*b^2*d^3)*x^2 + 3*(3*a^2*b^3*c^2
*d - 3*a^3*b^2*c*d^2 + a^4*b*d^3)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^3*b
^6*c^3*g^4 - 3*a^4*b^5*c^2*d*g^4 + 3*a^5*b^4*c*d^2*g^4 - a^6*b^3*d^3*g^4 +
(b^9*c^3*g^4 - 3*a*b^8*c^2*d*g^4 + 3*a^2*b^7*c*d^2*g^4 - a^3*b^6*d^3*g^4)*x
^3 + 3*(a*b^8*c^3*g^4 - 3*a^2*b^7*c^2*d*g^4 + 3*a^3*b^6*c*d^2*g^4 - a^4*b^5
*d^3*g^4)*x^2 + 3*(a^2*b^7*c^3*g^4 - 3*a^3*b^6*c^2*d*g^4 + 3*a^4*b^5*c*d^2*
g^4 - a^5*b^4*d^3*g^4)*x))*B^2*d^2*i^2 - 2/3*(3*b*x + a)*A*B*c*d*i^2*log(e*
(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3
*g^4*x + a^3*b^2*g^4) - 2/3*(3*b^2*x^2 + 3*a*b*x + a^2)*A*B*d^2*i^2*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*
g^4*x + a^3*b^3*g^4) - 1/3*B^2*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n)^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*(3
*b*x + a)*A^2*c*d*i^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^
3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*A^2*d^2*i^2/(b^6*g^4*x^3 + 3*a
```

```
*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 2/3*A*B*c^2*i^2*log(e*(b*x/
(d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*
x + a^3*b*g^4) - 1/3*A^2*c^2*i^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2
*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 0.599645, size = 1890, normalized size = 12.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="fricas")
```

```
[Out] -1/27*(2*(B^2*b^3*c^3 - B^2*a^3*d^3)*i^2*n^2 + 6*(A*B*b^3*c^3 - A*B*a^3*d^3
)*i^2*n + 9*(A^2*b^3*c^3 - A^2*a^3*d^3)*i^2 + 3*(2*(B^2*b^3*c*d^2 - B^2*a*b
^2*d^3)*i^2*n^2 + 6*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*i^2*n + 9*(A^2*b^3*c*d^
2 - A^2*a*b^2*d^3)*i^2)*x^2 + 9*(3*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*i^2*x^2
+ 3*(B^2*b^3*c^2*d - B^2*a^2*b*d^3)*i^2*x + (B^2*b^3*c^3 - B^2*a^3*d^3)*i^2
)*log(e)^2 + 9*(B^2*b^3*d^3*i^2*n^2*x^3 + 3*B^2*b^3*c*d^2*i^2*n^2*x^2 + 3*B
^2*b^3*c^2*d*i^2*n^2*x + B^2*b^3*c^3*i^2*n^2)*log((b*x + a)/(d*x + c))^2 +
3*(2*(B^2*b^3*c^2*d - B^2*a^2*b*d^3)*i^2*n^2 + 6*(A*B*b^3*c^2*d - A*B*a^2*b
*d^3)*i^2*n + 9*(A^2*b^3*c^2*d - A^2*a^2*b*d^3)*i^2)*x + 6*((B^2*b^3*c^3 -
B^2*a^3*d^3)*i^2*n + 3*(A*B*b^3*c^3 - A*B*a^3*d^3)*i^2 + 3*((B^2*b^3*c*d^2
- B^2*a*b^2*d^3)*i^2*n + 3*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*i^2)*x^2 + 3*((B
^2*b^3*c^2*d - B^2*a^2*b*d^3)*i^2*n + 3*(A*B*b^3*c^2*d - A*B*a^2*b*d^3)*i^2
)*x + 3*(B^2*b^3*d^3*i^2*n*x^3 + 3*B^2*b^3*c*d^2*i^2*n*x^2 + 3*B^2*b^3*c^2*
d*i^2*n*x + B^2*b^3*c^3*i^2*n)*log((b*x + a)/(d*x + c)))*log(e) + 6*(B^2*b^
3*c^3*i^2*n^2 + 3*A*B*b^3*c^3*i^2*n + (B^2*b^3*d^3*i^2*n^2 + 3*A*B*b^3*d^3*
i^2*n)*x^3 + 3*(B^2*b^3*c*d^2*i^2*n^2 + 3*A*B*b^3*c*d^2*i^2*n)*x^2 + 3*(B^2
*b^3*c^2*d*i^2*n^2 + 3*A*B*b^3*c^2*d*i^2*n)*x)*log((b*x + a)/(d*x + c)))/((
b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*x^2 + 3*(a^2*b^5*c -
 a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^4, x)
```

3.176 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=319

$$-\frac{bi^2(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^2}-\frac{bBi^2n(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^2}+\frac{di^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^5(a+bx)^3(bc-ad)^2}$$

```
[Out] (2*B^2*d*i^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*B^2*i
^2*n^2*(c + d*x)^4)/(32*(b*c - a*d)^2*g^5*(a + b*x)^4) + (2*B*d*i^2*n*(c +
d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^2*g^5*(a + b*
x)^3) - (b*B*i^2*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(8*(
b*c - a*d)^2*g^5*(a + b*x)^4) + (d*i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2)/(3*(b*c - a*d)^2*g^5*(a + b*x)^3) - (b*i^2*(c + d*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Rubi [C] time = 3.78887, antiderivative size = 989, normalized size of antiderivative = 3.1, number of steps used = 98, number of rules used = 11, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.244, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2i^2n^2\log^2(a+bx)d^4}{12b^3(bc-ad)^2g^5}-\frac{B^2i^2n^2\log^2(c+dx)d^4}{12b^3(bc-ad)^2g^5}+\frac{7B^2i^2n^2\log(a+bx)d^4}{72b^3(bc-ad)^2g^5}+\frac{Bi^2n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^4}{6b^3(bc-ad)^2g^5}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^5,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*i^2*n^2)/(32*b^3*g^5*(a + b*x)^4) - (11*B^2*d*(b*c - a*
d)*i^2*n^2)/(216*b^3*g^5*(a + b*x)^3) + (5*B^2*d^2*i^2*n^2)/(144*b^3*g^5*(a
 + b*x)^2) + (7*B^2*d^3*i^2*n^2)/(72*b^3*(b*c - a*d)*g^5*(a + b*x)) + (7*B^
2*d^4*i^2*n^2*Log[a + b*x])/(72*b^3*(b*c - a*d)^2*g^5) - (B^2*d^4*i^2*n^2*L
og[a + b*x]^2)/(12*b^3*(b*c - a*d)^2*g^5) - (B*(b*c - a*d)^2*i^2*n*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(8*b^3*g^5*(a + b*x)^4) - (5*B*d*(b*c - a*d
)*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(18*b^3*g^5*(a + b*x)^3) -
(B*d^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(12*b^3*g^5*(a + b*x)^
2) + (B*d^3*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^3*(b*c - a*d
)*g^5*(a + b*x)) + (B*d^4*i^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(6*b^3*(b*c - a*d)^2*g^5) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n])^2)/(4*b^3*g^5*(a + b*x)^4) - (2*d*(b*c - a*d)*i^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b^3*g^5*(a + b*x)^3) - (d^2*i^2*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^3*g^5*(a + b*x)^2) - (7*B^2*d^
4*i^2*n^2*Log[c + d*x])/(72*b^3*(b*c - a*d)^2*g^5) + (B^2*d^4*i^2*n^2*Log[-
((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(6*b^3*(b*c - a*d)^2*g^5) - (B*d
^4*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(6*b^3*(b*c -
 a*d)^2*g^5) - (B^2*d^4*i^2*n^2*Log[c + d*x]^2)/(12*b^3*(b*c - a*d)^2*g^5)
+ (B^2*d^4*i^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(6*b^3*(b*c
 - a*d)^2*g^5) + (B^2*d^4*i^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])
/(6*b^3*(b*c - a*d)^2*g^5) + (B^2*d^4*i^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/(6*b^3*(b*c - a*d)^2*g^5)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(176c+176dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx = \int\left(\frac{30976(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^5(a+bx)^5} + \frac{61952d(bc-ad)\,\cdots}{b^2g^5\cdots}\right.$$

$$= \frac{\left(30976d^2\right)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^3}dx}{b^2g^5} + \frac{(61952d(bc-ad))\int\frac{\left(A+B\log\left(e\cdots\right.\right.}{(a+\cdots}}{b^2g^5}$$

$$= -\frac{7744(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc-ad)\left(A+\cdots\right.}{3b^3g^5(a\cdots}$$

$$= -\frac{7744(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc-ad)\left(A+\cdots\right.}{3b^3g^5(a\cdots}$$

$$= -\frac{7744(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc-ad)\left(A+\cdots\right.}{3b^3g^5(a\cdots}$$

$$= -\frac{7744(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^5(a+bx)^4} - \frac{61952d(bc-ad)\left(A+\cdots\right.}{3b^3g^5(a\cdots}$$

$$= -\frac{3872B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^5(a+bx)^4} - \frac{77440Bd(bc-ad)n\,\cdots}{9b^3g^5\cdots}$$

$$= -\frac{3872B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^5(a+bx)^4} - \frac{77440Bd(bc-ad)n\,\cdots}{9b^3g^5\cdots}$$

$$= -\frac{3872B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^3g^5(a+bx)^4} - \frac{77440Bd(bc-ad)n\,\cdots}{9b^3g^5\cdots}$$

$$= -\frac{968B^2(bc-ad)^2n^2}{b^3g^5(a+bx)^4} - \frac{42592B^2d(bc-ad)n^2}{27b^3g^5(a+bx)^3} + \frac{9680B^2d^2n^2}{9b^3g^5(a+bx)^2} + \cdots$$

$$= -\frac{968B^2(bc-ad)^2n^2}{b^3g^5(a+bx)^4} - \frac{42592B^2d(bc-ad)n^2}{27b^3g^5(a+bx)^3} + \frac{9680B^2d^2n^2}{9b^3g^5(a+bx)^2} + \cdots$$

$$= -\frac{968B^2(bc-ad)^2n^2}{b^3g^5(a+bx)^4} - \frac{42592B^2d(bc-ad)n^2}{27b^3g^5(a+bx)^3} + \frac{9680B^2d^2n^2}{9b^3g^5(a+bx)^2} + \cdots$$

Mathematica [C] time = 3.14642, size = 1860, normalized size = 5.83

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^5,x]
```

```
[Out] -(i^2*(216*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 576*d*(
-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 432*d^
```

```
2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 216*
B*d^2*n*(a + b*x)^2*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*
d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*d^2
*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*B*d*n*
(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x])
 + B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Lo
g[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*(Log[a
 + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d
*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*Log[(d*(a + b*x))/
(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)])) + 32*B*d*n*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a
+ b*x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d
)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*
x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a
*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c
+ d*x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*
d^3*n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 3*B*n*(36*(b*c - a*
d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(a + b*
x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^
2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)
^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a + b*x
]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*c - a*
d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n*(a +
b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Lo
g[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(b*c -
a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^
3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*(3*(b*
c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)
^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] +
12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*x]*(Lo
g[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) +
a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
]))))/(864*b^3*(b*c - a*d)^2*g^5*(a + b*x)^4)
```

Maple [F] time = 0.703, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^5} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

Maxima [B] time = 4.47387, size = 10917, normalized size = 34.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x,
 algorithm="maxima")
```

```
[Out] 1/24*A*B*c^2*i^2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b
*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*
b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 -
a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a
^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 -
a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 -
 a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^
7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c
^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4
- 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) -
1/72*A*B*d^2*i^2*n*((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7
*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^
3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^
3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*
b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b
^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*
b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4
*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^
5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c
*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2
- 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a
^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*
b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/36*A*B*c*d*i^2*n*((7*a*b^3*c^3 - 33*a^2*
b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3
- 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*
a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d
 + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d
+ 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d
 + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*
d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d +
 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/
((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d
^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d +
6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) - 1/6*(4*b*x + a)*
B^2*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^6*g^5*x^4 + 4*a*b^5
*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/12*(6*b^2
*x^2 + 4*a*b*x + a^2)*B^2*d^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/
(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*
b^3*g^5) + 1/288*(12*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a
^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d -
5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^
2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2
 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^
2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d
^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2
- a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b
^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*
c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)
)*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 21
6*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*
```

d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*
(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^
4)*log(b*x + a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 +
4*a^3*b*d^4*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^
2 + 324*a^2*b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x
^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4
*d^4*x^4 + 100*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a
^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^
4*x + a^4*d^4)*log(b*x + a))*log(d*x + c))*n^2/(a^4*b^5*c^4*g^5 - 4*a^5*b^4
*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 +
(b^9*c^4*g^5 - 4*a*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*
g^5 + a^4*b^5*d^4*g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3
*b^6*c^2*d^2*g^5 - 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*
c^4*g^5 - 4*a^3*b^6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5
+ a^6*b^3*d^4*g^5)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*
b^4*c^2*d^2*g^5 - 4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2*c^2*i^2 -
1/432*(12*n*((7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3
+ 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^
2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*
b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^
4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3
+ 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^
2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x
+ (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 1
2*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^
2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*
x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^
4*b^2*d^4)*g^5))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (37*a*b^4*c^4 - 3
04*a^2*b^3*c^3*d + 1512*a^3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 +
12*(88*b^5*c^2*d^2 - 101*a*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5*c^3*
d - 609*a*b^4*c^2*d^2 + 648*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*(4*a^4
*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2
*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3
- a^4*b*d^4)*x)*log(b*x + a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3
- a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^
3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x)*log(d*x + c)^2 +
4*(16*b^5*c^4 - 163*a*b^4*c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*c*d^3
+ 115*a^4*b*d^4)*x + 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*
a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*
d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x)*log(b*x
+ a) - 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4)*x^4
+ 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^
2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 - a^
5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3
+ 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*
x)*log(b*x + a))*log(d*x + c))*n^2/(a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*g^5 +
6*a^6*b^4*c^2*d^2*g^5 - 4*a^7*b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10*c^4*
g^5 - 4*a*b^9*c^3*d*g^5 + 6*a^2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 + a^4
*b^6*d^4*g^5)*x^4 + 4*(a*b^9*c^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*
d^2*g^5 - 4*a^4*b^6*c*d^3*g^5 + a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 -
4*a^3*b^7*c^3*d*g^5 + 6*a^4*b^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6*b^
4*d^4*g^5)*x^2 + 4*(a^3*b^7*c^4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2*d
^2*g^5 - 4*a^6*b^4*c*d^3*g^5 + a^7*b^3*d^4*g^5)*x))*B^2*c*d*i^2 - 1/864*(12
n((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6
*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2
*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c
^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^
2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3
*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^

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4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a
^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*
b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*
log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^
3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x
+ c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*
b^3*d^4)*g^5))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (115*a^2*b^4*c^4 -
1360*a^3*b^3*c^3*d + 1512*a^4*b^2*c^2*d^2 - 304*a^5*b*c*d^3 + 37*a^6*d^4 -
12*(108*b^6*c^3*d - 148*a*b^5*c^2*d^2 + 47*a^2*b^4*c*d^3 - 7*a^3*b^3*d^4)*x
^3 + 6*(36*b^6*c^4 - 712*a*b^5*c^3*d + 903*a^2*b^4*c^2*d^2 - 264*a^3*b^3*c*
d^3 + 37*a^4*b^2*d^4)*x^2 + 72*(6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4
 + (6*b^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 + 4*(6*a*b^5*c^2*d^2 -
 4*a^2*b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^
3 + a^4*b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*
x)*log(b*x + a)^2 + 72*(6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^
6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b
^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*
b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x)*log(d
*x + c)^2 + 4*(76*a*b^5*c^4 - 1057*a^2*b^4*c^3*d + 1248*a^3*b^3*c^2*d^2 - 3
04*a^4*b^2*c*d^3 + 37*a^5*b*d^4)*x - 12*(108*a^4*b^2*c^2*d^2 - 40*a^5*b*c*d
^3 + 7*a^6*d^4 + (108*b^6*c^2*d^2 - 40*a*b^5*c*d^3 + 7*a^2*b^4*d^4)*x^4 + 4
*(108*a*b^5*c^2*d^2 - 40*a^2*b^4*c*d^3 + 7*a^3*b^3*d^4)*x^3 + 6*(108*a^2*b^
4*c^2*d^2 - 40*a^3*b^3*c*d^3 + 7*a^4*b^2*d^4)*x^2 + 4*(108*a^3*b^3*c^2*d^2
- 40*a^4*b^2*c*d^3 + 7*a^5*b*d^4)*x)*log(b*x + a) + 12*(108*a^4*b^2*c^2*d^2
 - 40*a^5*b*c*d^3 + 7*a^6*d^4 + (108*b^6*c^2*d^2 - 40*a*b^5*c*d^3 + 7*a^2*b
^4*d^4)*x^4 + 4*(108*a*b^5*c^2*d^2 - 40*a^2*b^4*c*d^3 + 7*a^3*b^3*d^4)*x^3
+ 6*(108*a^2*b^4*c^2*d^2 - 40*a^3*b^3*c*d^3 + 7*a^4*b^2*d^4)*x^2 + 4*(108*a
^3*b^3*c^2*d^2 - 40*a^4*b^2*c*d^3 + 7*a^5*b*d^4)*x - 12*(6*a^4*b^2*c^2*d^2
- 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4)*x
^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4
*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^
4*b^2*c*d^3 + a^5*b*d^4)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^4*b^7*c^4*g^
5 - 4*a^5*b^6*c^3*d*g^5 + 6*a^6*b^5*c^2*d^2*g^5 - 4*a^7*b^4*c*d^3*g^5 + a^8
*b^3*d^4*g^5 + (b^11*c^4*g^5 - 4*a*b^10*c^3*d*g^5 + 6*a^2*b^9*c^2*d^2*g^5 -
 4*a^3*b^8*c*d^3*g^5 + a^4*b^7*d^4*g^5)*x^4 + 4*(a*b^10*c^4*g^5 - 4*a^2*b^9
*c^3*d*g^5 + 6*a^3*b^8*c^2*d^2*g^5 - 4*a^4*b^7*c*d^3*g^5 + a^5*b^6*d^4*g^5)
*x^3 + 6*(a^2*b^9*c^4*g^5 - 4*a^3*b^8*c^3*d*g^5 + 6*a^4*b^7*c^2*d^2*g^5 - 4
*a^5*b^6*c*d^3*g^5 + a^6*b^5*d^4*g^5)*x^2 + 4*(a^3*b^8*c^4*g^5 - 4*a^4*b^7*
c^3*d*g^5 + 6*a^5*b^6*c^2*d^2*g^5 - 4*a^6*b^5*c*d^3*g^5 + a^7*b^4*d^4*g^5)*
x))*B^2*d^2*i^2 - 1/3*(4*b*x + a)*A*B*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n)/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^
5*x + a^4*b^2*g^5) - 1/6*(6*b^2*x^2 + 4*a*b*x + a^2)*A*B*d^2*i^2*log(e*(b*x
/(d*x + c) + a/(d*x + c))^n)/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5
*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/4*B^2*c^2*i^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 +
4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/6*(4*b*x + a)*A^2*c*d*i^2/(b^6*g^5*x^4 + 4
*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/12*
(6*b^2*x^2 + 4*a*b*x + a^2)*A^2*d^2*i^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*
a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/2*A*B*c^2*i^2*log(e*(b
*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g
^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^2*c^2*i^2/(b^5*g^5*x^4 + 4*a*
b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 0.715539, size = 3484, normalized size = 10.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x,
 algorithm="fricas")
```

```
[Out] -1/864*((27*B^2*b^4*c^4 - 64*B^2*a*b^3*c^3*d + 37*B^2*a^4*d^4)*i^2*n^2 + 12
*(9*A*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 7*A*B*a^4*d^4)*i^2*n - 12*(7*(B^2*b^
4*c*d^3 - B^2*a*b^3*d^4)*i^2*n^2 + 12*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*i^2*n
)*x^3 + 72*(3*A^2*b^4*c^4 - 4*A^2*a*b^3*c^3*d + A^2*a^4*d^4)*i^2 - 6*((5*B^
2*b^4*c^2*d^2 + 32*B^2*a*b^3*c*d^3 - 37*B^2*a^2*b^2*d^4)*i^2*n^2 - 12*(A*B*
b^4*c^2*d^2 - 8*A*B*a*b^3*c*d^3 + 7*A*B*a^2*b^2*d^4)*i^2*n - 72*(A^2*b^4*c^
2*d^2 - 2*A^2*a*b^3*c*d^3 + A^2*a^2*b^2*d^4)*i^2)*x^2 + 72*(6*(B^2*b^4*c^2*
d^2 - 2*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*i^2*x^2 + 4*(2*B^2*b^4*c^3*d - 3
*B^2*a*b^3*c^2*d^2 + B^2*a^3*b*d^4)*i^2*x + (3*B^2*b^4*c^4 - 4*B^2*a*b^3*c^
3*d + B^2*a^4*d^4)*i^2)*log(e)^2 - 72*(B^2*b^4*d^4*i^2*n^2*x^4 + 4*B^2*a*b^
3*d^4*i^2*n^2*x^3 - 6*(B^2*b^4*c^2*d^2 - 2*B^2*a*b^3*c*d^3)*i^2*n^2*x^2 - 4
*(2*B^2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2)*i^2*n^2*x - (3*B^2*b^4*c^4 - 4*B^2
*a*b^3*c^3*d)*i^2*n^2)*log((b*x + a)/(d*x + c))^2 + 4*((11*B^2*b^4*c^3*d -
48*B^2*a*b^3*c^2*d^2 + 37*B^2*a^3*b*d^4)*i^2*n^2 + 12*(5*A*B*b^4*c^3*d - 12
*A*B*a*b^3*c^2*d^2 + 7*A*B*a^3*b*d^4)*i^2*n + 72*(2*A^2*b^4*c^3*d - 3*A^2*a
*b^3*c^2*d^2 + A^2*a^3*b*d^4)*i^2)*x - 12*(12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^
4)*i^2*n*x^3 - (9*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 7*B^2*a^4*d^4)*i^2*n -
 12*(3*A*B*b^4*c^4 - 4*A*B*a*b^3*c^3*d + A*B*a^4*d^4)*i^2 - 6*((B^2*b^4*c^2
*d^2 - 8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d^4)*i^2*n + 12*(A*B*b^4*c^2*d^2 -
 2*A*B*a*b^3*c*d^3 + A*B*a^2*b^2*d^4)*i^2)*x^2 - 4*((5*B^2*b^4*c^3*d - 12*B
^2*a*b^3*c^2*d^2 + 7*B^2*a^3*b*d^4)*i^2*n + 12*(2*A*B*b^4*c^3*d - 3*A*B*a*b
^3*c^2*d^2 + A*B*a^3*b*d^4)*i^2)*x + 12*(B^2*b^4*d^4*i^2*n*x^4 + 4*B^2*a*b^
3*d^4*i^2*n*x^3 - 6*(B^2*b^4*c^2*d^2 - 2*B^2*a*b^3*c*d^3)*i^2*n*x^2 - 4*(2*
B^2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2)*i^2*n*x - (3*B^2*b^4*c^4 - 4*B^2*a*b^3
*c^3*d)*i^2*n)*log((b*x + a)/(d*x + c)))*log(e) + 12*((9*B^2*b^4*c^4 - 16*B
^2*a*b^3*c^3*d)*i^2*n^2 - (7*B^2*b^4*d^4*i^2*n^2 + 12*A*B*b^4*d^4*i^2*n)*x^
4 + 12*(3*A*B*b^4*c^4 - 4*A*B*a*b^3*c^3*d)*i^2*n - 4*(12*A*B*a*b^3*d^4*i^2*
n + (3*B^2*b^4*c*d^3 + 4*B^2*a*b^3*d^4)*i^2*n^2)*x^3 + 6*((B^2*b^4*c^2*d^2
- 8*B^2*a*b^3*c*d^3)*i^2*n^2 + 12*(A*B*b^4*c^2*d^2 - 2*A*B*a*b^3*c*d^3)*i^2
*n)*x^2 + 4*((5*B^2*b^4*c^3*d - 12*B^2*a*b^3*c^2*d^2)*i^2*n^2 + 12*(2*A*B*b
^4*c^3*d - 3*A*B*a*b^3*c^2*d^2)*i^2*n)*x)*log((b*x + a)/(d*x + c)))/((b^9*c
^2 - 2*a*b^8*c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^
3*b^6*d^2)*g^5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2
+ 4*(a^3*b^6*c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^
5*b^4*c*d + a^6*b^3*d^2)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**5
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(bgx+ag)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^5, x)
```

3.177 $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^6}\,dx$

Optimal. Leaf size=493

$$-\frac{b^2i^2(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{5g^6(a+bx)^5(bc-ad)^3}-\frac{2b^2Bi^2n(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{25g^6(a+bx)^5(bc-ad)^3}-\frac{d^2i^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}{3g^6(a+bx)^3(bc-ad)^3}$$

```
[Out] (-2*B^2*d^2*i^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)^3*g^6*(a + b*x)^3) + (b*B^
2*d*i^2*n^2*(c + d*x)^4)/(16*(b*c - a*d)^3*g^6*(a + b*x)^4) - (2*b^2*B^2*i^
2*n^2*(c + d*x)^5)/(125*(b*c - a*d)^3*g^6*(a + b*x)^5) - (2*B*d^2*i^2*n*(c
+ d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^3*g^6*(a +
b*x)^3) + (b*B*d*i^2*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(4*(b*c - a*d)^3*g^6*(a + b*x)^4) - (2*b^2*B*i^2*n*(c + d*x)^5*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(25*(b*c - a*d)^3*g^6*(a + b*x)^5) - (d^2*i^2*(
c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^3*g^6*(
a + b*x)^3) + (b*d*i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
)/(2*(b*c - a*d)^3*g^6*(a + b*x)^4) - (b^2*i^2*(c + d*x)^5*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2)/(5*(b*c - a*d)^3*g^6*(a + b*x)^5)
```

Rubi [C] time = 4.31635, antiderivative size = 1085, normalized size of antiderivative = 2.2, number of steps used = 110, number of rules used = 11, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.244, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^2n^2\log^2(a+bx)d^5}{30b^3(bc-ad)^3g^6}+\frac{B^2i^2n^2\log^2(c+dx)d^5}{30b^3(bc-ad)^3g^6}-\frac{47B^2i^2n^2\log(a+bx)d^5}{900b^3(bc-ad)^3g^6}-\frac{Bi^2n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^5}{15b^3(bc-ad)^3g^6}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^6,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*i^2*n^2)/(125*b^3*g^6*(a + b*x)^5) - (7*B^2*d*(b*c -
a*d)*i^2*n^2)/(400*b^3*g^6*(a + b*x)^4) + (43*B^2*d^2*i^2*n^2)/(2700*b^3*g^
6*(a + b*x)^3) - (13*B^2*d^3*i^2*n^2)/(1800*b^3*(b*c - a*d)*g^6*(a + b*x)^2
) - (47*B^2*d^4*i^2*n^2)/(900*b^3*(b*c - a*d)^2*g^6*(a + b*x)) - (47*B^2*d^
5*i^2*n^2*Log[a + b*x])/(900*b^3*(b*c - a*d)^3*g^6) + (B^2*d^5*i^2*n^2*Log[
a + b*x]^2)/(30*b^3*(b*c - a*d)^3*g^6) - (2*B*(b*c - a*d)^2*i^2*n*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(25*b^3*g^6*(a + b*x)^5) - (3*B*d*(b*c - a*d
)*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^3*g^6*(a + b*x)^4) -
(B*d^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(45*b^3*g^6*(a + b*x)^
3) + (B*d^3*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b^3*(b*c - a*
d)*g^6*(a + b*x)^2) - (B*d^4*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(15*b^3*(b*c - a*d)^2*g^6*(a + b*x)) - (B*d^5*i^2*n*Log[a + b*x]*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(15*b^3*(b*c - a*d)^3*g^6) - ((b*c - a*d)^2*i
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b^3*g^6*(a + b*x)^5) - (d*(
b*c - a*d)*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^3*g^6*(a + b*
x)^4) - (d^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b^3*g^6*(a +
b*x)^3) + (47*B^2*d^5*i^2*n^2*Log[c + d*x])/(900*b^3*(b*c - a*d)^3*g^6) - (
B^2*d^5*i^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(15*b^3*(b*
c - a*d)^3*g^6) + (B*d^5*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c
 + d*x])/(15*b^3*(b*c - a*d)^3*g^6) + (B^2*d^5*i^2*n^2*Log[c + d*x]^2)/(30*
b^3*(b*c - a*d)^3*g^6) - (B^2*d^5*i^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b
```

```
*c - a*d)])/(15*b^3*(b*c - a*d)^3*g^6) - (B^2*d^5*i^2*n^2*PolyLog[2, -((d*(
a + b*x))/(b*c - a*d))])/(15*b^3*(b*c - a*d)^3*g^6) - (B^2*d^5*i^2*n^2*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(15*b^3*(b*c - a*d)^3*g^6)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(177c+177dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^6}\,dx = \int\left(\frac{31329(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^2g^6(a+bx)^6} + \frac{62658d(bc-ad)\left(\right.}{b^2g^6}\right.$$

$$= \frac{\left(31329d^2\right)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^4}dx}{b^2g^6} + \frac{(62658d(bc-ad))\int\frac{\left(A+B\log\left(\right.\right.}{(a+}}{b^2g^6}$$

$$= -\frac{31329(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-ad)\left(A\right.}{2b^3g^6(a}$$

$$= -\frac{31329(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-ad)\left(A\right.}{2b^3g^6(a}$$

$$= -\frac{31329(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-ad)\left(A\right.}{2b^3g^6(a}$$

$$= -\frac{31329(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b^3g^6(a+bx)^5} - \frac{31329d(bc-ad)\left(A\right.}{2b^3g^6(a}$$

$$= -\frac{62658B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{25b^3g^6(a+bx)^5} - \frac{93987Bd(bc-ad)n}{20b^3}$$

$$= -\frac{62658B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{25b^3g^6(a+bx)^5} - \frac{93987Bd(bc-ad)n}{20b^3}$$

$$= -\frac{62658B(bc-ad)^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{25b^3g^6(a+bx)^5} - \frac{93987Bd(bc-ad)n}{20b^3}$$

$$= -\frac{62658B^2(bc-ad)^2n^2}{125b^3g^6(a+bx)^5} - \frac{219303B^2d(bc-ad)n^2}{400b^3g^6(a+bx)^4} + \frac{149683B^2d^2n^2}{300b^3g^6(a+bx}$$

$$= -\frac{62658B^2(bc-ad)^2n^2}{125b^3g^6(a+bx)^5} - \frac{219303B^2d(bc-ad)n^2}{400b^3g^6(a+bx)^4} + \frac{149683B^2d^2n^2}{300b^3g^6(a+bx}$$

$$= -\frac{62658B^2(bc-ad)^2n^2}{125b^3g^6(a+bx)^5} - \frac{219303B^2d(bc-ad)n^2}{400b^3g^6(a+bx)^4} + \frac{149683B^2d^2n^2}{300b^3g^6(a+bx}$$

Mathematica [C] time = 3.96675, size = 2320, normalized size = 4.71

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^6,x]
```

```
[Out] -(i^2*(10800*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 27000
*d*(b*c - a*d)^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 18000
```

```
*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
+ 1000*B*d^2*n*(a + b*x)^2*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) -
 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 3
6*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*L
og[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b
*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*
B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a +
 b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x])
- 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/
(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a
 + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 375*B*d*n*(a + b*x)*(36*(b*
c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(
a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a +
 b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a
+ b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*
c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n
*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x
)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(
b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2
+ 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*
(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a
+ b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b
*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*
x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])) + 6*B*n*(-225*a*B*d*(b*c - a*d)^4*n + 144*B*(b*c - a*d)^5*n - 225
*b*B*d*(b*c - a*d)^4*n*x + 300*a*B*d^2*(b*c - a*d)^3*n*(a + b*x) - 180*B*d*
(b*c - a*d)^4*n*(a + b*x) + 300*b*B*d^2*(b*c - a*d)^3*n*x*(a + b*x) - 450*a
*B*d^3*(b*c - a*d)^2*n*(a + b*x)^2 + 640*B*d^2*(b*c - a*d)^3*n*(a + b*x)^2
- 450*b*B*d^3*(b*c - a*d)^2*n*x*(a + b*x)^2 + 900*a*B*d^4*(b*c - a*d)*n*(a
+ b*x)^3 - 1860*B*d^3*(b*c - a*d)^2*n*(a + b*x)^3 + 900*b*B*d^4*(b*c - a*d)
*n*x*(a + b*x)^3 + 3600*b*B*c*d^4*n*(a + b*x)^4 - 3600*a*B*d^5*n*(a + b*x)^
4 + 3720*B*d^4*(b*c - a*d)*n*(a + b*x)^4 + 900*a*B*d^5*n*(a + b*x)^4*Log[a
+ b*x] + 900*b*B*d^5*n*x*(a + b*x)^4*Log[a + b*x] + 7320*B*d^5*n*(a + b*x)^
5*Log[a + b*x] + 720*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) -
 900*d*(b*c - a*d)^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120
0*d^2*(b*c - a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 18
00*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 3
600*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36
00*d^5*(a + b*x)^5*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 90
0*a*B*d^5*n*(a + b*x)^4*Log[c + d*x] - 900*b*B*d^5*n*x*(a + b*x)^4*Log[c +
d*x] - 7320*B*d^5*n*(a + b*x)^5*Log[c + d*x] - 3600*d^5*(a + b*x)^5*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 1800*B*d^5*n*(a + b*x)^5*(Lo
g[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2,
 (d*(a + b*x))/(-(b*c) + a*d)]) + 1800*B*d^5*n*(a + b*x)^5*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)]))))/(54000*b^3*(b*c - a*d)^3*g^6*(a + b*x)^5)
```

Maple [F] time = 0.733, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^2}{(bgx+ag)^6}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x)
```

Maxima [B] time = 6.13958, size = 14764, normalized size = 29.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,
 algorithm="maxima")
```

```
[Out] -1/150*A*B*c^2*i^2*n*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a
^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^
4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^
4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4
 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x
^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 +
 a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d
^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c
^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*
b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d
^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*
c*d^3 + a^9*b*d^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 1
0*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6)
- 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a
^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6)) - 1/900*A*B*d^2*i^2*n*(
(47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3
 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*
(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 +
10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3
+ 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c
^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d +
 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^
4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g
^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7
*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b
^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^
5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a
^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^
3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^
8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4
*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*lo
g(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*
d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6)) - 1/300*A*B*c*d*i^2*n*((27*a*b^4
*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d
^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3
+ 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*
```

d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) - 1/10*(5*b*x + a)*B^2*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*d^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1/9000*(60*n*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (144*b^5*c^5 - 1125*a*b^4*c^4*d + 4000*a^2*b^3*c^3*d^2 - 9000*a^3*b^2*c^2*d^3 + 18000*a^4*b*c*d^4 - 12019*a^5*d^5 + 8220*(b^5*c*d^4 - a*b^4*d^5)*x^4 - 30*(77*b^5*c^2*d^3 - 1250*a*b^4*c*d^4 + 1173*a^2*b^3*d^5)*x^3 + 10*(94*b^5*c^3*d^2 - 975*a*b^4*c^2*d^3 + 6600*a^2*b^3*c*d^4 - 5719*a^3*b^2*d^5)*x^2 - 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a)^2 - 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(d*x + c)^2 - 5*(81*b^5*c^4*d - 700*a*b^4*c^3*d^2 + 3000*a^2*b^3*c^2*d^3 - 10800*a^3*b^2*c*d^4 + 8419*a^4*b*d^5)*x + 8220*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a) - 60*(137*b^5*d^5*x^5 + 685*a*b^4*d^5*x^4 + 1370*a^2*b^3*d^5*x^3 + 1370*a^3*b^2*d^5*x^2 + 685*a^4*b*d^5*x + 137*a^5*d^5 - 60*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a))*log(d*x + c))*n^2/(a^5*b^6*c^5*g^6 - 5*a^6*b^5*c^4*d*g^6 + 10*a^7*b^4*c^3*d^2*g^6 - 10*a^8*b^3*c^2*d^3*g^6 + 5*a^9*b^2*c*d^4*g^6 - a^10*b*d^5*g^6 + (b^11*c^5*g^6 - 5*a*b^10*c^4*d*g^6 + 10*a^2*b^9*c^3*d^2*g^6 - 10*a^3*b^8*c^2*d^3*g^6 + 5*a^4*b^7*c*d^4*g^6 - a^5*b^6*d^5*g^6)*x^5 + 5*(a*b^10*c^5*g^6 - 5*a^2*b^9*c^4*d*g^6 + 10*a^3*b^8*c^3*d^2*g^6 - 10*a^4*b^7*c^2*d^3*g^6 + 5*a^5*b^6*c*d^4*g^6 - a^6*b^5*d^5*g^6)*x^4 + 10*(a^2*b^9*c^5*g^6 - 5*a^3*b^8*c^4*d*g^6 + 10*a^4*b^7*c^3*d^2*g^6 - 10*a^5*b^6*c^2*d^3*g^6 + 5*a^6*b^5*c*d^4*g^6 - a^7*b^4*d^5*g^6)*x^3 + 10*(a^3*b^8*c^5*g^6 - 5*a^4*b^7*c^4*d*g^6 + 10*a^5*b^6*c^3*d^2*g^6 - 10*a^6*b^5*c^2*d^3*g^6 + 5*a^7*b^4*c*d^4*g^6 - a^8*b^3*d^5*g^6)*x^2 + 5*(a^4*b^7*c^5*g^6 - 5*a^5*b^6*c^4*d*g^6 + 10*a^6*b^5*c^3*d^2*g^6 - 10*a^7*b^4*c^2*d^3*g^6 + 5*a^8*b^3*c*d^4*g^6 - a^9*b^2*d^5*g^6)*x))*B^2*c^2*i^2 - 1/18000*(60*n*((27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77

*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*
c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*
b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*
b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^
3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^1
0*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4
)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b
^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5
*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*
a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x +
(a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*
b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4
*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^
5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*log(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 1
0*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6
))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (549*a*b^5*c^5 - 4625*a^2*b^4*c
^4*d + 19000*a^3*b^3*c^3*d^2 - 63000*a^4*b^2*c^2*d^3 + 51875*a^5*b*c*d^4 -
3799*a^6*d^5 - 60*(625*b^6*c^2*d^3 - 702*a*b^5*c*d^4 + 77*a^2*b^4*d^5)*x^4
+ 30*(325*b^6*c^3*d^2 - 5667*a*b^5*c^2*d^3 + 5975*a^2*b^4*c*d^4 - 633*a^3*b
^3*d^5)*x^3 - 10*(350*b^6*c^4*d - 3949*a*b^5*c^3*d^2 + 29475*a^2*b^4*c^2*d^
3 - 28775*a^3*b^3*c*d^4 + 2899*a^4*b^2*d^5)*x^2 + 1800*(5*a^5*b*c*d^4 - a^6
*d^5 + (5*b^6*c*d^4 - a*b^5*d^5)*x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^4*d^5)*x^4
+ 10*(5*a^2*b^4*c*d^4 - a^3*b^3*d^5)*x^3 + 10*(5*a^3*b^3*c*d^4 - a^4*b^2*d^
5)*x^2 + 5*(5*a^4*b^2*c*d^4 - a^5*b*d^5)*x)*log(b*x + a)^2 + 1800*(5*a^5*b*
c*d^4 - a^6*d^5 + (5*b^6*c*d^4 - a*b^5*d^5)*x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^
4*d^5)*x^4 + 10*(5*a^2*b^4*c*d^4 - a^3*b^3*d^5)*x^3 + 10*(5*a^3*b^3*c*d^4 -
 a^4*b^2*d^5)*x^2 + 5*(5*a^4*b^2*c*d^4 - a^5*b*d^5)*x)*log(d*x + c)^2 + 5*(
225*b^6*c^5 - 2201*a*b^5*c^4*d + 10900*a^2*b^4*c^3*d^2 - 46200*a^3*b^3*c^2*
d^3 + 41075*a^4*b^2*c*d^4 - 3799*a^5*b*d^5)*x - 60*(625*a^5*b*c*d^4 - 77*a^
6*d^5 + (625*b^6*c*d^4 - 77*a*b^5*d^5)*x^5 + 5*(625*a*b^5*c*d^4 - 77*a^2*b^
4*d^5)*x^4 + 10*(625*a^2*b^4*c*d^4 - 77*a^3*b^3*d^5)*x^3 + 10*(625*a^3*b^3*
c*d^4 - 77*a^4*b^2*d^5)*x^2 + 5*(625*a^4*b^2*c*d^4 - 77*a^5*b*d^5)*x)*log(b
x + a) + 60(625*a^5*b*c*d^4 - 77*a^6*d^5 + (625*b^6*c*d^4 - 77*a*b^5*d^5)
x^5 + 5(625*a*b^5*c*d^4 - 77*a^2*b^4*d^5)*x^4 + 10*(625*a^2*b^4*c*d^4 - 7
7*a^3*b^3*d^5)*x^3 + 10*(625*a^3*b^3*c*d^4 - 77*a^4*b^2*d^5)*x^2 + 5*(625*a
^4*b^2*c*d^4 - 77*a^5*b*d^5)*x - 60*(5*a^5*b*c*d^4 - a^6*d^5 + (5*b^6*c*d^4
 - a*b^5*d^5)*x^5 + 5*(5*a*b^5*c*d^4 - a^2*b^4*d^5)*x^4 + 10*(5*a^2*b^4*c*d
^4 - a^3*b^3*d^5)*x^3 + 10*(5*a^3*b^3*c*d^4 - a^4*b^2*d^5)*x^2 + 5*(5*a^4*b
^2*c*d^4 - a^5*b*d^5)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^5*b^7*c^5*g^6 -
 5*a^6*b^6*c^4*d*g^6 + 10*a^7*b^5*c^3*d^2*g^6 - 10*a^8*b^4*c^2*d^3*g^6 + 5*
a^9*b^3*c*d^4*g^6 - a^10*b^2*d^5*g^6 + (b^12*c^5*g^6 - 5*a*b^11*c^4*d*g^6 +
 10*a^2*b^10*c^3*d^2*g^6 - 10*a^3*b^9*c^2*d^3*g^6 + 5*a^4*b^8*c*d^4*g^6 - a
^5*b^7*d^5*g^6)*x^5 + 5*(a*b^11*c^5*g^6 - 5*a^2*b^10*c^4*d*g^6 + 10*a^3*b^9
*c^3*d^2*g^6 - 10*a^4*b^8*c^2*d^3*g^6 + 5*a^5*b^7*c*d^4*g^6 - a^6*b^6*d^5*g
^6)*x^4 + 10*(a^2*b^10*c^5*g^6 - 5*a^3*b^9*c^4*d*g^6 + 10*a^4*b^8*c^3*d^2*g
^6 - 10*a^5*b^7*c^2*d^3*g^6 + 5*a^6*b^6*c*d^4*g^6 - a^7*b^5*d^5*g^6)*x^3 +
10*(a^3*b^9*c^5*g^6 - 5*a^4*b^8*c^4*d*g^6 + 10*a^5*b^7*c^3*d^2*g^6 - 10*a^6
*b^6*c^2*d^3*g^6 + 5*a^7*b^5*c*d^4*g^6 - a^8*b^4*d^5*g^6)*x^2 + 5*(a^4*b^8*
c^5*g^6 - 5*a^5*b^7*c^4*d*g^6 + 10*a^6*b^6*c^3*d^2*g^6 - 10*a^7*b^5*c^2*d^3
*g^6 + 5*a^8*b^4*c*d^4*g^6 - a^9*b^3*d^5*g^6)*x))*B^2*c*d*i^2 - 1/54000*(60
n((47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c
*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 -
 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^
3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*
d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b
^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3
*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^1
1*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^
4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5

*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a ^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^ 9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/ ((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4 *b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5* c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6))*log(e*(b*x/(d*x + c) + a/(d* x + c))^n) + (1489*a^2*b^5*c^5 - 14375*a^3*b^4*c^4*d + 85000*a^4*b^3*c^3*d^ 2 - 85000*a^5*b^2*c^2*d^3 + 14375*a^6*b*c*d^4 - 1489*a^7*d^5 + 60*(1100*b^7 *c^3*d^2 - 1425*a*b^6*c^2*d^3 + 372*a^2*b^5*c*d^4 - 47*a^3*b^4*d^5)*x^4 - 3 0*(500*b^7*c^4*d - 9825*a*b^6*c^3*d^2 + 11937*a^2*b^5*c^2*d^3 - 2975*a^3*b^ 4*c*d^4 + 363*a^4*b^3*d^5)*x^3 + 10*(400*b^7*c^5 - 5450*a*b^6*c^4*d + 49189 *a^2*b^5*c^3*d^2 - 55525*a^3*b^4*c^2*d^3 + 12875*a^4*b^3*c*d^4 - 1489*a^5*b ^2*d^5)*x^2 - 1800*(10*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7* c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^ 5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4 *b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x)*log(b*x + a)^2 - 1800*(10*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a *b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3 *b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4* b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x)*log(d*x + c)^2 + 5*(925*a*b^6 *c^5 - 9911*a^2*b^5*c^4*d + 67900*a^3*b^4*c^3*d^2 - 71800*a^4*b^3*c^2*d^3 + 14375*a^5*b^2*c*d^4 - 1489*a^6*b*d^5)*x + 60*(1100*a^5*b^2*c^2*d^3 - 325*a ^6*b*c*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5* d^5)*x^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 + 10*(1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^ 4*b^3*c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)*x)*log(b*x + a) - 60*(110 0*a^5*b^2*c^2*d^3 - 325*a^6*b*c*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325* a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d ^4 + 47*a^3*b^4*d^5)*x^4 + 10*(1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 4 7*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5* b^2*d^5)*x^2 + 5*(1100*a^4*b^3*c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)* x - 60*(10*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5* a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^ 3*b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^ 3 + 10*(10*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4 *b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x)*log(b*x + a))*log(d*x + c))* n^2/(a^5*b^8*c^5*g^6 - 5*a^6*b^7*c^4*d*g^6 + 10*a^7*b^6*c^3*d^2*g^6 - 10*a^ 8*b^5*c^2*d^3*g^6 + 5*a^9*b^4*c*d^4*g^6 - a^10*b^3*d^5*g^6 + (b^13*c^5*g^6 - 5*a*b^12*c^4*d*g^6 + 10*a^2*b^11*c^3*d^2*g^6 - 10*a^3*b^10*c^2*d^3*g^6 + 5*a^4*b^9*c*d^4*g^6 - a^5*b^8*d^5*g^6)*x^5 + 5*(a*b^12*c^5*g^6 - 5*a^2*b^11 *c^4*d*g^6 + 10*a^3*b^10*c^3*d^2*g^6 - 10*a^4*b^9*c^2*d^3*g^6 + 5*a^5*b^8*c *d^4*g^6 - a^6*b^7*d^5*g^6)*x^4 + 10*(a^2*b^11*c^5*g^6 - 5*a^3*b^10*c^4*d*g ^6 + 10*a^4*b^9*c^3*d^2*g^6 - 10*a^5*b^8*c^2*d^3*g^6 + 5*a^6*b^7*c*d^4*g^6 - a^7*b^6*d^5*g^6)*x^3 + 10*(a^3*b^10*c^5*g^6 - 5*a^4*b^9*c^4*d*g^6 + 10*a^ 5*b^8*c^3*d^2*g^6 - 10*a^6*b^7*c^2*d^3*g^6 + 5*a^7*b^6*c*d^4*g^6 - a^8*b^5* d^5*g^6)*x^2 + 5*(a^4*b^9*c^5*g^6 - 5*a^5*b^8*c^4*d*g^6 + 10*a^6*b^7*c^3*d^ 2*g^6 - 10*a^7*b^6*c^2*d^3*g^6 + 5*a^8*b^5*c*d^4*g^6 - a^9*b^4*d^5*g^6)*x)) *B^2*d^2*i^2 - 1/5*(5*b*x + a)*A*B*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6 *x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) - 1/15*(10*b^2*x^2 + 5*a*b*x + a^2)*A *B*d^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^8*g^6*x^5 + 5*a*b^7*g^ 6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3 *g^6) - 1/5*B^2*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^6*g^6*x

```
^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*
g^6*x + a^5*b*g^6) - 1/10*(5*b*x + a)*A^2*c*d*i^2/(b^7*g^6*x^5 + 5*a*b^6*g^
6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2
*g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*A^2*d^2*i^2/(b^8*g^6*x^5 + 5*a*b^
7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5
*b^3*g^6) - 2/5*A*B*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^6*g^6
*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^
2*g^6*x + a^5*b*g^6) - 1/5*A^2*c^2*i^2/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*
a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6)
```

Fricas [B] time = 0.835333, size = 5374, normalized size = 10.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,
 algorithm="fricas")
```

```
[Out] -1/54000*((864*B^2*b^5*c^5 - 3375*B^2*a*b^4*c^4*d + 4000*B^2*a^2*b^3*c^3*d^
2 - 1489*B^2*a^5*d^5)*i^2*n^2 + 60*(47*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*i^2*
n^2 + 60*(A*B*b^5*c*d^4 - A*B*a*b^4*d^5)*i^2*n)*x^4 + 60*(72*A*B*b^5*c^5 -
225*A*B*a*b^4*c^4*d + 200*A*B*a^2*b^3*c^3*d^2 - 47*A*B*a^5*d^5)*i^2*n + 30*
((13*B^2*b^5*c^2*d^3 + 350*B^2*a*b^4*c*d^4 - 363*B^2*a^2*b^3*d^5)*i^2*n^2 -
 60*(A*B*b^5*c^2*d^3 - 10*A*B*a*b^4*c*d^4 + 9*A*B*a^2*b^3*d^5)*i^2*n)*x^3 +
 1800*(6*A^2*b^5*c^5 - 15*A^2*a*b^4*c^4*d + 10*A^2*a^2*b^3*c^3*d^2 - A^2*a^
5*d^5)*i^2 - 10*((86*B^2*b^5*c^3*d^2 - 375*B^2*a*b^4*c^2*d^3 - 1200*B^2*a^2
*b^3*c*d^4 + 1489*B^2*a^3*b^2*d^5)*i^2*n^2 - 60*(2*A*B*b^5*c^3*d^2 - 15*A*B
*a*b^4*c^2*d^3 + 60*A*B*a^2*b^3*c*d^4 - 47*A*B*a^3*b^2*d^5)*i^2*n - 1800*(A
^2*b^5*c^3*d^2 - 3*A^2*a*b^4*c^2*d^3 + 3*A^2*a^2*b^3*c*d^4 - A^2*a^3*b^2*d^
5)*i^2)*x^2 + 1800*(10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b
^3*c*d^4 - B^2*a^3*b^2*d^5)*i^2*x^2 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*
d^2 + 6*B^2*a^2*b^3*c^2*d^3 - B^2*a^4*b*d^5)*i^2*x + (6*B^2*b^5*c^5 - 15*B^
2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3*d^2 - B^2*a^5*d^5)*i^2)*log(e)^2 + 1800*
(B^2*b^5*d^5*i^2*n^2*x^5 + 5*B^2*a*b^4*d^5*i^2*n^2*x^4 + 10*B^2*a^2*b^3*d^5
*i^2*n^2*x^3 + 10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3*c*
d^4)*i^2*n^2*x^2 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3
*c^2*d^3)*i^2*n^2*x + (6*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*
c^3*d^2)*i^2*n^2)*log((b*x + a)/(d*x + c))^2 + 5*((189*B^2*b^5*c^4*d - 1100
*B^2*a*b^4*c^3*d^2 + 2400*B^2*a^2*b^3*c^2*d^3 - 1489*B^2*a^4*b*d^5)*i^2*n^2
 + 60*(27*A*B*b^5*c^4*d - 100*A*B*a*b^4*c^3*d^2 + 120*A*B*a^2*b^3*c^2*d^3 -
 47*A*B*a^4*b*d^5)*i^2*n + 1800*(3*A^2*b^5*c^4*d - 8*A^2*a*b^4*c^3*d^2 + 6*
A^2*a^2*b^3*c^2*d^3 - A^2*a^4*b*d^5)*i^2)*x + 60*(60*(B^2*b^5*c*d^4 - B^2*a
*b^4*d^5)*i^2*n*x^4 - 30*(B^2*b^5*c^2*d^3 - 10*B^2*a*b^4*c*d^4 + 9*B^2*a^2*
b^3*d^5)*i^2*n*x^3 + (72*B^2*b^5*c^5 - 225*B^2*a*b^4*c^4*d + 200*B^2*a^2*b^
3*c^3*d^2 - 47*B^2*a^5*d^5)*i^2*n + 60*(6*A*B*b^5*c^5 - 15*A*B*a*b^4*c^4*d
+ 10*A*B*a^2*b^3*c^3*d^2 - A*B*a^5*d^5)*i^2 + 10*((2*B^2*b^5*c^3*d^2 - 15*B
^2*a*b^4*c^2*d^3 + 60*B^2*a^2*b^3*c*d^4 - 47*B^2*a^3*b^2*d^5)*i^2*n + 60*(A
*B*b^5*c^3*d^2 - 3*A*B*a*b^4*c^2*d^3 + 3*A*B*a^2*b^3*c*d^4 - A*B*a^3*b^2*d^
5)*i^2)*x^2 + 5*((27*B^2*b^5*c^4*d - 100*B^2*a*b^4*c^3*d^2 + 120*B^2*a^2*b^
3*c^2*d^3 - 47*B^2*a^4*b*d^5)*i^2*n + 60*(3*A*B*b^5*c^4*d - 8*A*B*a*b^4*c^3
*d^2 + 6*A*B*a^2*b^3*c^2*d^3 - A*B*a^4*b*d^5)*i^2)*x + 60*(B^2*b^5*d^5*i^2*
n*x^5 + 5*B^2*a*b^4*d^5*i^2*n*x^4 + 10*B^2*a^2*b^3*d^5*i^2*n*x^3 + 10*(B^2*
b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3*c*d^4)*i^2*n*x^2 + 5*(3*B
^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3*c^2*d^3)*i^2*n*x + (6*B^
2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3*d^2)*i^2*n)*log((b*x +
a)/(d*x + c)))*log(e) + 60*((47*B^2*b^5*d^5*i^2*n^2 + 60*A*B*b^5*d^5*i^2*n)
```

```
*x^5 + (72*B^2*b^5*c^5 - 225*B^2*a*b^4*c^4*d + 200*B^2*a^2*b^3*c^3*d^2)*i^2
*n^2 + 5*(60*A*B*a*b^4*d^5*i^2*n + (12*B^2*b^5*c*d^4 + 35*B^2*a*b^4*d^5)*i^
2*n^2)*x^4 + 60*(6*A*B*b^5*c^5 - 15*A*B*a*b^4*c^4*d + 10*A*B*a^2*b^3*c^3*d^
2)*i^2*n + 10*(60*A*B*a^2*b^3*d^5*i^2*n - (3*B^2*b^5*c^2*d^3 - 30*B^2*a*b^4
*c*d^4 - 20*B^2*a^2*b^3*d^5)*i^2*n^2)*x^3 + 10*((2*B^2*b^5*c^3*d^2 - 15*B^2
*a*b^4*c^2*d^3 + 60*B^2*a^2*b^3*c*d^4)*i^2*n^2 + 60*(A*B*b^5*c^3*d^2 - 3*A*
B*a*b^4*c^2*d^3 + 3*A*B*a^2*b^3*c*d^4)*i^2*n)*x^2 + 5*((27*B^2*b^5*c^4*d -
100*B^2*a*b^4*c^3*d^2 + 120*B^2*a^2*b^3*c^2*d^3)*i^2*n^2 + 60*(3*A*B*b^5*c^
4*d - 8*A*B*a*b^4*c^3*d^2 + 6*A*B*a^2*b^3*c^2*d^3)*i^2*n)*x)*log((b*x + a)/
(d*x + c)))/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^
6*x^5 + 5*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^
6*x^4 + 10*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*
g^6*x^3 + 10*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3
)*g^6*x^2 + 5*(a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^
3)*g^6*x + (a^5*b^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*
g^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**6
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left(B \log \left(e \left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)^6} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^6, x)
```

3.178 $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=1172

result too large to display

```
[Out] (5*B^2*(b*c - a*d)^6*g^3*i^3*n^2*x)/(84*b^3*d^3) + (B^2*(b*c - a*d)^3*g^3*i
^3*n^2*(a + b*x)^4)/(140*b^4) - (29*B^2*(b*c - a*d)^5*g^3*i^3*n^2*(c + d*x)
^2)/(840*b^2*d^4) + (47*B^2*(b*c - a*d)^4*g^3*i^3*n^2*(c + d*x)^3)/(1260*b*
d^4) - (13*B^2*(b*c - a*d)^3*g^3*i^3*n^2*(c + d*x)^4)/(420*d^4) + (b*B^2*(b
*c - a*d)^2*g^3*i^3*n^2*(c + d*x)^5)/(105*d^4) - (B*(b*c - a*d)^4*g^3*i^3*n
*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(210*b^4*d) - (3*B*(b*
c - a*d)^3*g^3*i^3*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(1
40*b^4) - (B*(b*c - a*d)^2*g^3*i^3*n*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(35*b^3) + (2*B*(b*c - a*d)^4*g^3*i^3*n*(c + d*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(21*b*d^4) - (3*B*(b*c - a*d)^3*g^
3*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(14*d^4) + (6*b
*B*(b*c - a*d)^2*g^3*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/(35*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*n*(c + d*x)^6*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/(21*d^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/(140*b^4) + ((b*c - a*d)^2*g^3*i^3*(a + b
*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(35*b^3) + ((b*c
- a*d)*g^3*i^3*(a + b*x)^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2)/(14*b^2) + (g^3*i^3*(a + b*x)^4*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^2)/(7*b) + (B*(b*c - a*d)^5*g^3*i^3*n*(a + b*x)^2*(3*A + B*n
+ 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(420*b^4*d^2) - (B*(b*c - a*d)^6*g^3
*i^3*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))/(420*b
^4*d^3) - (B*(b*c - a*d)^7*g^3*i^3*n*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(
c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(420*b^4*d^4) - (B^2*(b*c - a
*d)^7*g^3*i^3*n^2*Log[(a + b*x)/(c + d*x)])/(210*b^4*d^4) - (11*B^2*(b*c -
a*d)^7*g^3*i^3*n^2*Log[c + d*x])/(420*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3
*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(70*b^4*d^4)
```

Rubi [A] time = 4.47879, antiderivative size = 961, normalized size of antiderivative = 0.82, number of steps used = 118, number of rules used = 13, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.289, Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^3i^3n^2\log^2(c+dx)(bc-ad)^7}{140b^4d^4}-\frac{B^2g^3i^3n^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)(bc-ad)^7}{70b^4d^4}+\frac{Bg^3i^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log}{70b^4d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2,x]
```

```
[Out] -(A*B*(b*c - a*d)^6*g^3*i^3*n*x)/(70*b^3*d^3) + (B^2*(b*c - a*d)^6*g^3*i^3*
n^2*x)/(70*b^3*d^3) - (3*B^2*(b*c - a*d)^5*g^3*i^3*n^2*(a + b*x)^2)/(280*b^
4*d^2) + (11*B^2*(b*c - a*d)^4*g^3*i^3*n^2*(a + b*x)^3)/(1260*b^4*d) + (B^2
*(b*c - a*d)^3*g^3*i^3*n^2*(a + b*x)^4)/(42*b^4) + (B^2*d*(b*c - a*d)^2*g^3
*i^3*n^2*(a + b*x)^5)/(105*b^4) - (B^2*(b*c - a*d)^6*g^3*i^3*n*(a + b*x)*Lo
g[e*((a + b*x)/(c + d*x))^n])/(70*b^4*d^3) + (B*(b*c - a*d)^5*g^3*i^3*n*(a
+ b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(140*b^4*d^2) - (B*(b*c -
a*d)^4*g^3*i^3*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(210*b
```

```
^4*d) - (17*B*(b*c - a*d)^3*g^3*i^3*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(140*b^4) - (B*d*(b*c - a*d)^2*g^3*i^3*n*(a + b*x)^5*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(7*b^4) - (B*d^2*(b*c - a*d)*g^3*i^3*n*(a
+ b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(21*b^4) + ((b*c - a*d)^3*
g^3*i^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b^4) + (3*
d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/(5*b^4) + (d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^2)/(2*b^4) + (d^3*g^3*i^3*(a + b*x)^7*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2)/(7*b^4) - (B^2*(b*c - a*d)^7*g^3*i^3*n^2*Log[-((d*(a + b
*x))/(b*c - a*d))]*Log[c + d*x])/(70*b^4*d^4) + (B*(b*c - a*d)^7*g^3*i^3*n*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(70*b^4*d^4) + (B^2*(b
*c - a*d)^7*g^3*i^3*n^2*Log[c + d*x]^2)/(140*b^4*d^4) - (B^2*(b*c - a*d)^7*
g^3*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(70*b^4*d^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (178c+178dx)^3(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(\frac{(-bc+ad)^3g^3(178c+178dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{d^3}\right.$$

$$= \frac{(b^3g^3)\int (178c+178dx)^6\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{5639752d^3} -$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^4}$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^4}$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^4}$$

$$= -\frac{1409938(bc-ad)^3g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^4}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{1409938B(bc-ad)^5g^3n(c}{3}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876B^2(bc-ad)^6g^3n(a}{35b^4d}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876B^2(bc-ad)^6g^3n(a}{35b^4d}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876B^2(bc-ad)^6g^3n^2x}{35b^3d^3}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876B^2(bc-ad)^6g^3n^2x}{35b^3d^3}$$

$$= \frac{2819876AB(bc-ad)^6g^3nx}{35b^3d^3} + \frac{2819876B^2(bc-ad)^6g^3n^2x}{35b^3d^3}$$

Mathematica [B] time = 3.81964, size = 2448, normalized size = 2.09

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]
```

```
[Out] (g^3*i^3*(35*(b*c - a*d)^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2 + 84*d*(b*c - a*d)^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2 + 70*d^2*(b*c - a*d)*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2 + 20*d^3*(a + b*x)^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (35*B*(b
```

*c - a*d)^4*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[
e*((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d
)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n
*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a
+ b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])))/(3*d^4) + (7*B*(b*c - a*d)^3*n*(24*A*b*d*(b*c - a*d)
^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d
^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3
*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a
+ b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[
c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x] + 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c
- a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(
b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x])
+ 12*B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c -
a*d)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 - (7*B*(b*c - a*d)^2*n*(
120*A*b*d*(b*c - a*d)^4*x + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x
)/(c + d*x))^n] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 24*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
) - 120*B*(b*c - a*d)^5*n*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[c + d*x] + 20*B*(b*c - a*d)^3*n*(2*b*d*(b*c - a*
d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 5*B*(b*c - a*d)^2*
n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*
x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(12*b*d*(b*c - a*d
)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3 - 3
d^4(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) + 60*B*(b*c - a*d)^4*n*(b
*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 60*B*(b*c - a*d)^5*n*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/(6*d^4) + (B*(b*c - a*d)*n*(360*A*b*d*(b*c - a*d)^5*x
+ 60*b^2*B*c*d*(b*c - a*d)^4*n*x - 60*a*b*B*d^2*(b*c - a*d)^4*n*x + 462*b*B
d(b*c - a*d)^5*n*x - 30*b*B*c*d^2*(b*c - a*d)^3*n*(a + b*x)^2 + 30*a*B*d^
3*(b*c - a*d)^3*n*(a + b*x)^2 - 141*B*d^2*(b*c - a*d)^4*n*(a + b*x)^2 + 20*
b*B*c*d^3*(b*c - a*d)^2*n*(a + b*x)^3 - 20*a*B*d^4*(b*c - a*d)^2*n*(a + b*x
)^3 + 54*B*d^3*(b*c - a*d)^3*n*(a + b*x)^3 - 15*b*B*c*d^4*(b*c - a*d)*n*(a
+ b*x)^4 + 15*a*B*d^5*(b*c - a*d)*n*(a + b*x)^4 - 18*B*d^4*(b*c - a*d)^2*n*
(a + b*x)^4 + 12*b*B*c*d^5*n*(a + b*x)^5 - 12*a*B*d^6*n*(a + b*x)^5 + 360*B
d(b*c - a*d)^5*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 180*d^2*(b*c -
a*d)^4*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120*d^3*(b*c -
a*d)^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 90*d^4*(b*c - a
d)^2(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^5*(b*c - a*
d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 60*d^6*(a + b*x)^6*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 60*b*B*c*(b*c - a*d)^5*n*Log[c + d
*x] + 60*a*B*d*(b*c - a*d)^5*n*Log[c + d*x] - 822*B*(b*c - a*d)^6*n*Log[c +
d*x] - 360*(b*c - a*d)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*
x] + 180*B*(b*c - a*d)^6*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c +
d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(9*d^4)))/(
140*b^4)

Maple [F] time = 0.726, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3}\left(dix+ci\right)^{3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 4.43479, size = 10591, normalized size = 9.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
```

```
[Out] 2/7*A*B*b^3*d^3*g^3*i^3*x^7*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/7*A^
2*b^3*d^3*g^3*i^3*x^7 + A*B*b^3*c*d^2*g^3*i^3*x^6*log(e*(b*x/(d*x + c) + a/
(d*x + c))^n) + A*B*a*b^2*d^3*g^3*i^3*x^6*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) + 1/2*A^2*b^3*c*d^2*g^3*i^3*x^6 + 1/2*A^2*a*b^2*d^3*g^3*i^3*x^6 + 6/5
*A*B*b^3*c^2*d*g^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 18/5*A*
B*a*b^2*c*d^2*g^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 6/5*A*B*
a^2*b*d^3*g^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/5*A^2*b^3*
c^2*d*g^3*i^3*x^5 + 9/5*A^2*a*b^2*c*d^2*g^3*i^3*x^5 + 3/5*A^2*a^2*b*d^3*g^3
*i^3*x^5 + 1/2*A*B*b^3*c^3*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n) + 9/2*A*B*a*b^2*c^2*d*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
 + 9/2*A*B*a^2*b*c*d^2*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
 1/2*A*B*a^3*d^3*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A
^2*b^3*c^3*g^3*i^3*x^4 + 9/4*A^2*a*b^2*c^2*d*g^3*i^3*x^4 + 9/4*A^2*a^2*b*c*
d^2*g^3*i^3*x^4 + 1/4*A^2*a^3*d^3*g^3*i^3*x^4 + 2*A*B*a*b^2*c^3*g^3*i^3*x^3
*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 6*A*B*a^2*b*c^2*d*g^3*i^3*x^3*log
(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a^3*c*d^2*g^3*i^3*x^3*log(e*(b*
x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b^2*c^3*g^3*i^3*x^3 + 3*A^2*a^2*b*c^2
*d*g^3*i^3*x^3 + A^2*a^3*c*d^2*g^3*i^3*x^3 + 3*A*B*a^2*b*c^3*g^3*i^3*x^2*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*A*B*a^3*c^2*d*g^3*i^3*x^2*log(e*(b
*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A^2*a^2*b*c^3*g^3*i^3*x^2 + 3/2*A^2*a^
3*c^2*d*g^3*i^3*x^2 + 1/210*A*B*b^3*d^3*g^3*i^3*n*(60*a^7*log(b*x + a)/b^7
- 60*c^7*log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6)*x^6 - 12*(b^6*c^2*d
^4 - a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*x^4 - 20*(b^6*c^4*d^
2 - a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - 60*(b^6*c^6 - a^6*d
^6)*x)/(b^6*d^6)) - 1/60*A*B*b^3*c*d^2*g^3*i^3*n*(60*a^6*log(b*x + a)/b^6 -
 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^
3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d -
 a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) - 1/60*A*B*a*b^2*d^3
*g^3*i^3*n*(60*a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*
d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2
 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^
5)*x)/(b^5*d^5)) + 1/10*A*B*b^3*c^2*d*g^3*i^3*n*(12*a^5*log(b*x + a)/b^5 -
12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 -
 a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*
x)/(b^4*d^4)) + 3/10*A*B*a*b^2*c*d^2*g^3*i^3*n*(12*a^5*log(b*x + a)/b^5 - 1
2*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 -
```

```
a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x
)/(b^4*d^4)) + 1/10*A*B*a^2*b*d^3*g^3*i^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c
^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2
*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(
b^4*d^4)) - 1/12*A*B*b^3*c^3*g^3*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(
d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x
^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 3/4*A*B*a*b^2*c^2*d*g^3*i^3*n*(6
*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)
*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))
- 3/4*A*B*a^2*b*c*d^2*g^3*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c
)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*
(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/12*A*B*a^3*d^3*g^3*i^3*n*(6*a^4*log(b
*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(
b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*a*b^
2*c^3*g^3*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 3*A*B*a^2*b*c^2*d*
g^3*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*
b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + A*B*a^3*c*d^2*g^3*i^3*n*
(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*a^2*b*c^3*g^3*i^3*n*(a^2*log
(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 3*A*B*a^3*c^2
*d*g^3*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(
b*d)) + 2*A*B*a^3*c^3*g^3*i^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A
*B*a^3*c^3*g^3*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a^3*c^3*g
^3*i^3*x - 1/420*(107*a^4*b^2*c^3*d^4*g^3*i^3*n^2 - 39*a^5*b*c^2*d^5*g^3*i^
3*n^2 + 6*a^6*c*d^6*g^3*i^3*n^2 - 6*b^6*c^7*g^3*i^3*n*log(e) - 6*(g^3*i^3*n
^2 - 7*g^3*i^3*n*log(e))*a*b^5*c^6*d + 3*(13*g^3*i^3*n^2 - 42*g^3*i^3*n*log
(e))*a^2*b^4*c^5*d^2 - (107*g^3*i^3*n^2 - 210*g^3*i^3*n*log(e))*a^3*b^3*c^4
*d^3)*B^2*log(d*x + c)/(b^3*d^4) + 1/70*(b^7*c^7*g^3*i^3*n^2 - 7*a*b^6*c^6*
d*g^3*i^3*n^2 + 21*a^2*b^5*c^5*d^2*g^3*i^3*n^2 - 35*a^3*b^4*c^4*d^3*g^3*i^3
*n^2 + 35*a^4*b^3*c^3*d^4*g^3*i^3*n^2 - 21*a^5*b^2*c^2*d^5*g^3*i^3*n^2 + 7*
a^6*b*c*d^6*g^3*i^3*n^2 - a^7*d^7*g^3*i^3*n^2)*(log(b*x + a)*log((b*d*x + a
*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) + 1
/2520*(360*B^2*b^7*d^7*g^3*i^3*x^7*log(e)^2 - 60*((2*g^3*i^3*n*log(e) - 21*
g^3*i^3*log(e)^2)*b^7*c*d^6 - (2*g^3*i^3*n*log(e) + 21*g^3*i^3*log(e)^2)*a*
b^6*d^7)*B^2*x^6 + 24*((g^3*i^3*n^2 - 15*g^3*i^3*n*log(e) + 63*g^3*i^3*log(
e)^2)*b^7*c^2*d^5 - (2*g^3*i^3*n^2 - 189*g^3*i^3*log(e)^2)*a*b^6*c*d^6 + (g
^3*i^3*n^2 + 15*g^3*i^3*n*log(e) + 63*g^3*i^3*log(e)^2)*a^2*b^5*d^7)*B^2*x^
5 + 6*((10*g^3*i^3*n^2 - 51*g^3*i^3*n*log(e) + 105*g^3*i^3*log(e)^2)*b^7*c^
3*d^4 - (10*g^3*i^3*n^2 + 147*g^3*i^3*n*log(e) - 945*g^3*i^3*log(e)^2)*a*b^
6*c^2*d^5 - (10*g^3*i^3*n^2 - 147*g^3*i^3*n*log(e) - 945*g^3*i^3*log(e)^2)*
a^2*b^5*c*d^6 + (10*g^3*i^3*n^2 + 51*g^3*i^3*n*log(e) + 105*g^3*i^3*log(e)^
2)*a^3*b^4*d^7)*B^2*x^4 + 2*((11*g^3*i^3*n^2 - 6*g^3*i^3*n*log(e))*b^7*c^4*
d^3 + 4*(19*g^3*i^3*n^2 - 147*g^3*i^3*n*log(e) + 315*g^3*i^3*log(e)^2)*a*b^
6*c^3*d^4 - 6*(29*g^3*i^3*n^2 - 630*g^3*i^3*log(e)^2)*a^2*b^5*c^2*d^5 + 4*(
19*g^3*i^3*n^2 + 147*g^3*i^3*n*log(e) + 315*g^3*i^3*log(e)^2)*a^3*b^4*c*d^6
 + (11*g^3*i^3*n^2 + 6*g^3*i^3*n*log(e))*a^4*b^3*d^7)*B^2*x^3 - 3*(3*(3*g^3
*i^3*n^2 - 2*g^3*i^3*n*log(e))*b^7*c^5*d^2 - (67*g^3*i^3*n^2 - 42*g^3*i^3*n
*log(e))*a*b^6*c^4*d^3 + 2*(29*g^3*i^3*n^2 + 252*g^3*i^3*n*log(e) - 630*g^3
*i^3*log(e)^2)*a^2*b^5*c^3*d^4 + 2*(29*g^3*i^3*n^2 - 252*g^3*i^3*n*log(e) -
 630*g^3*i^3*log(e)^2)*a^3*b^4*c^2*d^5 - (67*g^3*i^3*n^2 + 42*g^3*i^3*n*log
(e))*a^4*b^3*c*d^6 + 3*(3*g^3*i^3*n^2 + 2*g^3*i^3*n*log(e))*a^5*b^2*d^7)*B^
2*x^2 - 18*(35*a^4*b^3*c^3*d^4*g^3*i^3*n^2 - 21*a^5*b^2*c^2*d^5*g^3*i^3*n^2
 + 7*a^6*b*c*d^6*g^3*i^3*n^2 - a^7*d^7*g^3*i^3*n^2)*B^2*log(b*x + a)^2 - 36
*(b^7*c^7*g^3*i^3*n^2 - 7*a*b^6*c^6*d*g^3*i^3*n^2 + 21*a^2*b^5*c^5*d^2*g^3*
i^3*n^2 - 35*a^3*b^4*c^4*d^3*g^3*i^3*n^2)*B^2*log(b*x + a)*log(d*x + c) + 1
8*(b^7*c^7*g^3*i^3*n^2 - 7*a*b^6*c^6*d*g^3*i^3*n^2 + 21*a^2*b^5*c^5*d^2*g^3
*i^3*n^2 - 35*a^3*b^4*c^4*d^3*g^3*i^3*n^2)*B^2*log(d*x + c)^2 + 6*(6*(g^3*i
^3*n^2 - g^3*i^3*n*log(e))*b^7*c^6*d - 3*(15*g^3*i^3*n^2 - 14*g^3*i^3*n*log
```

(e))*a*b^6*c^5*d^2 + 2*(73*g^3*i^3*n^2 - 63*g^3*i^3*n*log(e))*a^2*b^5*c^4*d
^3 - 2*(107*g^3*i^3*n^2 - 210*g^3*i^3*log(e)^2)*a^3*b^4*c^3*d^4 + 2*(73*g^3
*i^3*n^2 + 63*g^3*i^3*n*log(e))*a^4*b^3*c^2*d^5 - 3*(15*g^3*i^3*n^2 + 14*g^
3*i^3*n*log(e))*a^5*b^2*c*d^6 + 6*(g^3*i^3*n^2 + g^3*i^3*n*log(e))*a^6*b*d^
7)*B^2*x - 6*(6*a*b^6*c^6*d*g^3*i^3*n^2 - 39*a^2*b^5*c^5*d^2*g^3*i^3*n^2 +
107*a^3*b^4*c^4*d^3*g^3*i^3*n^2 + 6*a^7*d^7*g^3*i^3*n*log(e) - (107*g^3*i^3
*n^2 + 210*g^3*i^3*n*log(e))*a^4*b^3*c^3*d^4 + 3*(13*g^3*i^3*n^2 + 42*g^3*i
^3*n*log(e))*a^5*b^2*c^2*d^5 - 6*(g^3*i^3*n^2 + 7*g^3*i^3*n*log(e))*a^6*b*c
*d^6)*B^2*log(b*x + a) + 18*(20*B^2*b^7*d^7*g^3*i^3*x^7 + 140*B^2*a^3*b^4*c
^3*d^4*g^3*i^3*x + 70*(b^7*c*d^6*g^3*i^3 + a*b^6*d^7*g^3*i^3)*B^2*x^6 + 84*
(b^7*c^2*d^5*g^3*i^3 + 3*a*b^6*c*d^6*g^3*i^3 + a^2*b^5*d^7*g^3*i^3)*B^2*x^5
 + 35*(b^7*c^3*d^4*g^3*i^3 + 9*a*b^6*c^2*d^5*g^3*i^3 + 9*a^2*b^5*c*d^6*g^3*
i^3 + a^3*b^4*d^7*g^3*i^3)*B^2*x^4 + 140*(a*b^6*c^3*d^4*g^3*i^3 + 3*a^2*b^5
*c^2*d^5*g^3*i^3 + a^3*b^4*c*d^6*g^3*i^3)*B^2*x^3 + 210*(a^2*b^5*c^3*d^4*g^
3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2*x^2)*log((b*x + a)^n)^2 + 18*(20*B^2*b
^7*d^7*g^3*i^3*x^7 + 140*B^2*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(b^7*c*d^6*g^3*
i^3 + a*b^6*d^7*g^3*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5*g^3*i^3 + 3*a*b^6*c*d^6*
g^3*i^3 + a^2*b^5*d^7*g^3*i^3)*B^2*x^5 + 35*(b^7*c^3*d^4*g^3*i^3 + 9*a*b^6*
c^2*d^5*g^3*i^3 + 9*a^2*b^5*c*d^6*g^3*i^3 + a^3*b^4*d^7*g^3*i^3)*B^2*x^4 +
140*(a*b^6*c^3*d^4*g^3*i^3 + 3*a^2*b^5*c^2*d^5*g^3*i^3 + a^3*b^4*c*d^6*g^3*
i^3)*B^2*x^3 + 210*(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2*
x^2)*log((d*x + c)^n)^2 + 6*(120*B^2*b^7*d^7*g^3*i^3*x^7*log(e) - 20*((g^3*
i^3*n - 21*g^3*i^3*log(e))*b^7*c*d^6 - (g^3*i^3*n + 21*g^3*i^3*log(e))*a*b^
6*d^7)*B^2*x^6 + 12*(126*a*b^6*c*d^6*g^3*i^3*log(e) - (5*g^3*i^3*n - 42*g^3
*i^3*log(e))*b^7*c^2*d^5 + (5*g^3*i^3*n + 42*g^3*i^3*log(e))*a^2*b^5*d^7)*B
^2*x^5 - 3*((17*g^3*i^3*n - 70*g^3*i^3*log(e))*b^7*c^3*d^4 + 7*(7*g^3*i^3*n
 - 90*g^3*i^3*log(e))*a*b^6*c^2*d^5 - 7*(7*g^3*i^3*n + 90*g^3*i^3*log(e))*a
^2*b^5*c*d^6 - (17*g^3*i^3*n + 70*g^3*i^3*log(e))*a^3*b^4*d^7)*B^2*x^4 - 2*
(b^7*c^4*d^3*g^3*i^3*n - a^4*b^3*d^7*g^3*i^3*n - 1260*a^2*b^5*c^2*d^5*g^3*i
^3*log(e) + 14*(7*g^3*i^3*n - 30*g^3*i^3*log(e))*a*b^6*c^3*d^4 - 14*(7*g^3*
i^3*n + 30*g^3*i^3*log(e))*a^3*b^4*c*d^6)*B^2*x^3 + 3*(b^7*c^5*d^2*g^3*i^3*
n - 7*a*b^6*c^4*d^3*g^3*i^3*n + 7*a^4*b^3*c*d^6*g^3*i^3*n - a^5*b^2*d^7*g^3
*i^3*n - 84*(g^3*i^3*n - 5*g^3*i^3*log(e))*a^2*b^5*c^3*d^4 + 84*(g^3*i^3*n
+ 5*g^3*i^3*log(e))*a^3*b^4*c^2*d^5)*B^2*x^2 - 6*(b^7*c^6*d*g^3*i^3*n - 7*a
*b^6*c^5*d^2*g^3*i^3*n + 21*a^2*b^5*c^4*d^3*g^3*i^3*n - 21*a^4*b^3*c^2*d^5*
g^3*i^3*n + 7*a^5*b^2*c*d^6*g^3*i^3*n - a^6*b*d^7*g^3*i^3*n - 140*a^3*b^4*c
^3*d^4*g^3*i^3*log(e))*B^2*x + 6*(35*a^4*b^3*c^3*d^4*g^3*i^3*n - 21*a^5*b^2
*c^2*d^5*g^3*i^3*n + 7*a^6*b*c*d^6*g^3*i^3*n - a^7*d^7*g^3*i^3*n)*B^2*log(b
x + a) + 6(b^7*c^7*g^3*i^3*n - 7*a*b^6*c^6*d*g^3*i^3*n + 21*a^2*b^5*c^5*d
^2*g^3*i^3*n - 35*a^3*b^4*c^4*d^3*g^3*i^3*n)*B^2*log(d*x + c))*log((b*x + a
)^n) - 6*(120*B^2*b^7*d^7*g^3*i^3*x^7*log(e) - 20*((g^3*i^3*n - 21*g^3*i^3*
log(e))*b^7*c*d^6 - (g^3*i^3*n + 21*g^3*i^3*log(e))*a*b^6*d^7)*B^2*x^6 + 12
*(126*a*b^6*c*d^6*g^3*i^3*log(e) - (5*g^3*i^3*n - 42*g^3*i^3*log(e))*b^7*c^
2*d^5 + (5*g^3*i^3*n + 42*g^3*i^3*log(e))*a^2*b^5*d^7)*B^2*x^5 - 3*((17*g^3
*i^3*n - 70*g^3*i^3*log(e))*b^7*c^3*d^4 + 7*(7*g^3*i^3*n - 90*g^3*i^3*log(e
))*a*b^6*c^2*d^5 - 7*(7*g^3*i^3*n + 90*g^3*i^3*log(e))*a^2*b^5*c*d^6 - (17*
g^3*i^3*n + 70*g^3*i^3*log(e))*a^3*b^4*d^7)*B^2*x^4 - 2*(b^7*c^4*d^3*g^3*i^
3*n - a^4*b^3*d^7*g^3*i^3*n - 1260*a^2*b^5*c^2*d^5*g^3*i^3*log(e) + 14*(7*g
^3*i^3*n - 30*g^3*i^3*log(e))*a*b^6*c^3*d^4 - 14*(7*g^3*i^3*n + 30*g^3*i^3*
log(e))*a^3*b^4*c*d^6)*B^2*x^3 + 3*(b^7*c^5*d^2*g^3*i^3*n - 7*a*b^6*c^4*d^3
*g^3*i^3*n + 7*a^4*b^3*c*d^6*g^3*i^3*n - a^5*b^2*d^7*g^3*i^3*n - 84*(g^3*i^
3*n - 5*g^3*i^3*log(e))*a^2*b^5*c^3*d^4 + 84*(g^3*i^3*n + 5*g^3*i^3*log(e))
*a^3*b^4*c^2*d^5)*B^2*x^2 - 6*(b^7*c^6*d*g^3*i^3*n - 7*a*b^6*c^5*d^2*g^3*i^
3*n + 21*a^2*b^5*c^4*d^3*g^3*i^3*n - 21*a^4*b^3*c^2*d^5*g^3*i^3*n + 7*a^5*b
^2*c*d^6*g^3*i^3*n - a^6*b*d^7*g^3*i^3*n - 140*a^3*b^4*c^3*d^4*g^3*i^3*log(
e))*B^2*x + 6*(35*a^4*b^3*c^3*d^4*g^3*i^3*n - 21*a^5*b^2*c^2*d^5*g^3*i^3*n
+ 7*a^6*b*c*d^6*g^3*i^3*n - a^7*d^7*g^3*i^3*n)*B^2*log(b*x + a) + 6*(b^7*c^
7*g^3*i^3*n - 7*a*b^6*c^6*d*g^3*i^3*n + 21*a^2*b^5*c^5*d^2*g^3*i^3*n - 35*a
^3*b^4*c^4*d^3*g^3*i^3*n)*B^2*log(d*x + c) + 6*(20*B^2*b^7*d^7*g^3*i^3*x^7

```
+ 140*B^2*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(b^7*c*d^6*g^3*i^3 + a*b^6*d^7*g^3
*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5*g^3*i^3 + 3*a*b^6*c*d^6*g^3*i^3 + a^2*b^5*d
^7*g^3*i^3)*B^2*x^5 + 35*(b^7*c^3*d^4*g^3*i^3 + 9*a*b^6*c^2*d^5*g^3*i^3 + 9
*a^2*b^5*c*d^6*g^3*i^3 + a^3*b^4*d^7*g^3*i^3)*B^2*x^4 + 140*(a*b^6*c^3*d^4*
g^3*i^3 + 3*a^2*b^5*c^2*d^5*g^3*i^3 + a^3*b^4*c*d^6*g^3*i^3)*B^2*x^3 + 210*
(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2*x^2)*log((b*x + a)^
n))*log((d*x + c)^n))/(b^4*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3d^3g^3i^3x^6 + A^2a^3c^3g^3i^3 + 3\left(A^2b^3cd^2 + A^2ab^2d^3\right)g^3i^3x^5 + 3\left(A^2b^3c^2d + 3\,A^2ab^2cd^2 + A^2a^2bd^3\right)g^3i^3x^4 +\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] integral(A^2*b^3*d^3*g^3*i^3*x^6 + A^2*a^3*c^3*g^3*i^3 + 3*(A^2*b^3*c*d^2 +
 A^2*a*b^2*d^3)*g^3*i^3*x^5 + 3*(A^2*b^3*c^2*d + 3*A^2*a*b^2*c*d^2 + A^2*a^
2*b*d^3)*g^3*i^3*x^4 + (A^2*b^3*c^3 + 9*A^2*a*b^2*c^2*d + 9*A^2*a^2*b*c*d^2
 + A^2*a^3*d^3)*g^3*i^3*x^3 + 3*(A^2*a*b^2*c^3 + 3*A^2*a^2*b*c^2*d + A^2*a^
3*c*d^2)*g^3*i^3*x^2 + 3*(A^2*a^2*b*c^3 + A^2*a^3*c^2*d)*g^3*i^3*x + (B^2*b
^3*d^3*g^3*i^3*x^6 + B^2*a^3*c^3*g^3*i^3 + 3*(B^2*b^3*c*d^2 + B^2*a*b^2*d^3
)*g^3*i^3*x^5 + 3*(B^2*b^3*c^2*d + 3*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*g^3*i
^3*x^4 + (B^2*b^3*c^3 + 9*B^2*a*b^2*c^2*d + 9*B^2*a^2*b*c*d^2 + B^2*a^3*d^3
)*g^3*i^3*x^3 + 3*(B^2*a*b^2*c^3 + 3*B^2*a^2*b*c^2*d + B^2*a^3*c*d^2)*g^3*i
^3*x^2 + 3*(B^2*a^2*b*c^3 + B^2*a^3*c^2*d)*g^3*i^3*x)*log(e*((b*x + a)/(d*x
 + c))^n)^2 + 2*(A*B*b^3*d^3*g^3*i^3*x^6 + A*B*a^3*c^3*g^3*i^3 + 3*(A*B*b^3
*c*d^2 + A*B*a*b^2*d^3)*g^3*i^3*x^5 + 3*(A*B*b^3*c^2*d + 3*A*B*a*b^2*c*d^2
+ A*B*a^2*b*d^3)*g^3*i^3*x^4 + (A*B*b^3*c^3 + 9*A*B*a*b^2*c^2*d + 9*A*B*a^2
*b*c*d^2 + A*B*a^3*d^3)*g^3*i^3*x^3 + 3*(A*B*a*b^2*c^3 + 3*A*B*a^2*b*c^2*d
+ A*B*a^3*c*d^2)*g^3*i^3*x^2 + 3*(A*B*a^2*b*c^3 + A*B*a^3*c^2*d)*g^3*i^3*x)
*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 (dix + ci)^3 \left(B\log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n)
 + A)^2, x)
```

3.179 $\int (ag+bgx)^2(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=976

$$\frac{Bg^2i^3n\left(2A+3Bn+2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)(bc-ad)^6}{60b^4d^3}+\frac{B^2g^2i^3n^2\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^6}{36b^4d^3}+\frac{11B^2g^2i^3n^2\log(c}{180b}$$

```
[Out] (-7*B^2*(b*c - a*d)^5*g^2*i^3*n^2*x)/(180*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g
^2*i^3*n^2*(c + d*x)^2)/(360*b^2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*n^2*(c +
 d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^3*n^2*(c + d*x)^4)/(60*d^3)
- (B*(b*c - a*d)^4*g^2*i^3*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(60*b^4*d) - (B*(b*c - a*d)^3*g^2*i^3*n*(a + b*x)^3*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(30*b^4) - (B*(b*c - a*d)^4*g^2*i^3*n*(c + d*x)^2*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^2*i
^3*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(45*b*d^3) + (7*B*
(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(15*d^3) + ((b*c - a*d)^3*g^2*i^3*(a + b*x)^3*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])^2)/(60*b^4) + ((b*c - a*d)^2*g^2*i^3*(a + b*x)^3*
(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(20*b^3) + ((b*c - a*d)
*g^2*i^3*(a + b*x)^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/
(10*b^2) + (g^2*i^3*(a + b*x)^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])^2)/(6*b) + (B*(b*c - a*d)^5*g^2*i^3*n*(a + b*x)*(2*A + B*n + 2*B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(60*b^4*d^2) + (B*(b*c - a*d)^6*g^2*i^3*n*(2
*A + 3*B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*
x))])/(60*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[(a + b*x)/(c + d*x)
])/(36*b^4*d^3) + (11*B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[c + d*x])/(180*b^4*
d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)])/(30*b^4*d^3)
```

Rubi [A] time = 3.19829, antiderivative size = 886, normalized size of antiderivative = 0.91, number of steps used = 83, number of rules used = 13, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.289, Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2g^2i^3n^2\log^2(a+bx)(bc-ad)^6}{60b^4d^3}-\frac{B^2g^2i^3n^2\log(a+bx)(bc-ad)^6}{45b^4d^3}-\frac{Bg^2i^3n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)(bc-}{30b^4d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2,x]
```

```
[Out] -(A*B*(b*c - a*d)^5*g^2*i^3*n*x)/(30*b^3*d^2) - (B^2*(b*c - a*d)^5*g^2*i^3*
n^2*x)/(45*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i^3*n^2*(c + d*x)^2)/(360*b^
2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*n^2*(c + d*x)^3)/(60*b*d^3) + (B^2*(b*c
 - a*d)^2*g^2*i^3*n^2*(c + d*x)^4)/(60*d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*n^
2*Log[a + b*x])/(45*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[a + b*x]^
2)/(60*b^4*d^3) - (B^2*(b*c - a*d)^5*g^2*i^3*n*(a + b*x)*Log[e*((a + b*x)/(
c + d*x))^n])/(30*b^4*d^2) - (B*(b*c - a*d)^4*g^2*i^3*n*(c + d*x)^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*n*
(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(90*b*d^3) + (7*B*(b*c
- a*d)^2*g^2*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*
```

```
d^3) - (b*B*(b*c - a*d)*g^2*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(15*d^3) - (B*(b*c - a*d)^6*g^2*i^3*n*Log[a + b*x]*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/(30*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^
4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*d^3) - (2*b*(b*c - a*d)*g^2*
i^3*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*d^3) + (b^2*g^
2*i^3*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*d^3) + (B^2*
(b*c - a*d)^6*g^2*i^3*n^2*Log[c + d*x])/(30*b^4*d^3) - (B^2*(b*c - a*d)^6*g
^2*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(30*b^4*d^3) - (B^2
*(b*c - a*d)^6*g^2*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(30*b^
4*d^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (179c+179dx)^3(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(\frac{(-bc+ad)^2g^2(179c+179dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{d^2}\right.$$

$$= \frac{(b^2g^2)\int (179c+179dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{32041d^2} -$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d^3}$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d^3}$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d^3}$$

$$= \frac{5735339(bc-ad)^2g^2(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d^3}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{5735339B(bc-ad)^4g^2n(}{}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{5735339B^2(bc-ad)^5g^2n}{30b^4}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{5735339B^2(bc-ad)^5g^2n}{30b^4}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{5735339B^2(bc-ad)^5g^2n}{45b^3d^2}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{5735339B^2(bc-ad)^5g^2n}{45b^3d^2}$$

$$= -\frac{5735339AB(bc-ad)^5g^2nx}{30b^3d^2} - \frac{5735339B^2(bc-ad)^5g^2n}{45b^3d^2}$$

Mathematica [A] time = 1.41987, size = 1627, normalized size = 1.67

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2,x]
```

```
[Out] (g^2*i^3*(15*(b*c - a*d)^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2 - 24*b*(b*c - a*d)*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2 + 10*b^2*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (5*B*(b*c
 - a*d)^3*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c -
```

```
a*d)*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2
 + 2*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a
+ b*x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
 + 6*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*
B*(b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a +
 b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)])))/b^4 + (2*B*(b*c - a*d)^2*n*(24*A*b*d*(b*c - a*d)^3*x - 12*B*
(b*c - a*d)^3*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*n*(2
*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b
*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*
(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x
)*Log[e*((a + b*x)/(c + d*x))^n] + 12*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]) + 8*b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]) + 6*b^4*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]) + 24*(b*c - a*d)^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] - 12*B*(b*c - a*d)^4*n*(Log[a +
 b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(
a + b*x))/(-(b*c) + a*d)])))/b^4 - (B*(b*c - a*d)*n*(120*A*b*d*(b*c - a*d)^
4*x - 60*B*(b*c - a*d)^4*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 20*B*(b*c -
 a*d)^3*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a +
b*x]) - 5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c +
 d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) - 2*B*(b*c - a*
d)*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b^3*(b*c
 - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b*x]) +
120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 60*b^2*(b*
c - a*d)^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 40*b^3*(b*c
 - a*d)^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 30*b^4*(b*c
- a*d)*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*b^5*(c + d*x
)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120*(b*c - a*d)^5*Log[a + b*x]
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*B*(b*c - a*d)^5*n*Log[c + d*x
] - 60*B*(b*c - a*d)^5*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/
(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(6*b^4)))/(60
*d^3)
```

Maple [F] time = 0.702, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2} \left(dix+ci\right)^{3} \left(A+B\ln \left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 4.07046, size = 8007, normalized size = 8.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="maxima")
```

```
[Out] 1/3*A*B*b^2*d^3*g^2*i^3*x^6*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/6*A^
2*b^2*d^3*g^2*i^3*x^6 + 6/5*A*B*b^2*c*d^2*g^2*i^3*x^5*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n) + 4/5*A*B*a*b*d^3*g^2*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n) + 3/5*A^2*b^2*c*d^2*g^2*i^3*x^5 + 2/5*A^2*a*b*d^3*g^2*i^3*x^5 +
 3/2*A*B*b^2*c^2*d*g^2*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*A
*B*a*b*c*d^2*g^2*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*B*a
^2*d^3*g^2*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/4*A^2*b^2*c^2
*d*g^2*i^3*x^4 + 3/2*A^2*a*b*c*d^2*g^2*i^3*x^4 + 1/4*A^2*a^2*d^3*g^2*i^3*x^
4 + 2/3*A*B*b^2*c^3*g^2*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 4*
A*B*a*b*c^2*d*g^2*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a^
2*c*d^2*g^2*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*b^2*c^
3*g^2*i^3*x^3 + 2*A^2*a*b*c^2*d*g^2*i^3*x^3 + A^2*a^2*c*d^2*g^2*i^3*x^3 + 2
*A*B*a*b*c^3*g^2*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*A*B*a^2
*c^2*d*g^2*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b*c^3*g^2
*i^3*x^2 + 3/2*A^2*a^2*c^2*d*g^2*i^3*x^2 - 1/180*A*B*b^2*d^3*g^2*i^3*n*(60*
a^6*log(b*x + a)/b^6 - 60*c^6*log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5
)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)
*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)
) + 1/10*A*B*b^2*c*d^2*g^2*i^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x
+ c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x
^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) +
 1/15*A*B*a*b*d^3*g^2*i^3*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/
d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 +
6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/4*
A*B*b^2*c^2*d*g^2*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 +
(2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3
 - a^3*d^3)*x)/(b^3*d^3)) - 1/2*A*B*a*b*c*d^2*g^2*i^3*n*(6*a^4*log(b*x + a)
/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2
*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/12*A*B*a^2*d^
3*g^2*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^
2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*
x)/(b^3*d^3)) + 1/3*A*B*b^2*c^3*g^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*l
og(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*
d^2)) + 2*A*B*a*b*c^2*d*g^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x +
 c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) +
A*B*a^2*c*d^2*g^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 -
((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*a*b*
c^3*g^2*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/
(b*d)) - 3*A*B*a^2*c^2*d*g^2*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)
/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^2*c^3*g^2*i^3*n*(a*log(b*x + a)/b - c
*log(d*x + c)/d) + 2*A*B*a^2*c^3*g^2*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x +
c))^n) + A^2*a^2*c^3*g^2*i^3*x - 1/180*(74*a^3*b^2*c^3*d^3*g^2*i^3*n^2 - 33
*a^4*b*c^2*d^4*g^2*i^3*n^2 + 6*a^5*c*d^5*g^2*i^3*n^2 - 2*(g^2*i^3*n^2 - 3*g
^2*i^3*n*log(e))*b^5*c^6 + 18*(g^2*i^3*n^2 - 2*g^2*i^3*n*log(e))*a*b^4*c^5*
d - 9*(7*g^2*i^3*n^2 - 10*g^2*i^3*n*log(e))*a^2*b^3*c^4*d^2)*B^2*log(d*x +
c)/(b^3*d^3) - 1/30*(b^6*c^6*g^2*i^3*n^2 - 6*a*b^5*c^5*d*g^2*i^3*n^2 + 15*a
^2*b^4*c^4*d^2*g^2*i^3*n^2 - 20*a^3*b^3*c^3*d^3*g^2*i^3*n^2 + 15*a^4*b^2*c^
2*d^4*g^2*i^3*n^2 - 6*a^5*b*c*d^5*g^2*i^3*n^2 + a^6*d^6*g^2*i^3*n^2)*(log(b
*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*
d)))*B^2/(b^4*d^3) + 1/360*(60*B^2*b^6*d^6*g^2*i^3*x^6*log(e)^2 - 24*((g^2*
i^3*n*log(e) - 9*g^2*i^3*log(e)^2)*b^6*c*d^5 - (g^2*i^3*n*log(e) + 6*g^2*i^
3*log(e)^2)*a*b^5*d^6)*B^2*x^5 + 6*((g^2*i^3*n^2 - 13*g^2*i^3*n*log(e) + 45
*g^2*i^3*log(e)^2)*b^6*c^2*d^4 - 2*(g^2*i^3*n^2 - 3*g^2*i^3*n*log(e) - 45*g
^2*i^3*log(e)^2)*a*b^5*c*d^5 + (g^2*i^3*n^2 + 7*g^2*i^3*n*log(e) + 15*g^2*i
^3*log(e)^2)*a^2*b^4*d^6)*B^2*x^4 + 2*((9*g^2*i^3*n^2 - 38*g^2*i^3*n*log(e)
 + 60*g^2*i^3*log(e)^2)*b^6*c^3*d^3 - 3*(5*g^2*i^3*n^2 + 14*g^2*i^3*n*log(e
) - 120*g^2*i^3*log(e)^2)*a*b^5*c^2*d^4 + 3*(g^2*i^3*n^2 + 26*g^2*i^3*n*log
(e) + 60*g^2*i^3*log(e)^2)*a^2*b^4*c*d^5 + (3*g^2*i^3*n^2 + 2*g^2*i^3*n*log
(e))*a^3*b^3*d^6)*B^2*x^3 + ((11*g^2*i^3*n^2 - 6*g^2*i^3*n*log(e))*b^6*c^4*
```

d^2 + 2*(5*g^2*i^3*n^2 - 102*g^2*i^3*n*log(e) + 180*g^2*i^3*log(e)^2)*a*b^5
*c^3*d^3 - 60*(g^2*i^3*n^2 - 3*g^2*i^3*n*log(e) - 9*g^2*i^3*log(e)^2)*a^2*b
^4*c^2*d^4 + 2*(23*g^2*i^3*n^2 + 18*g^2*i^3*n*log(e))*a^3*b^3*c*d^5 - (7*g^
2*i^3*n^2 + 6*g^2*i^3*n*log(e))*a^4*b^2*d^6)*B^2*x^2 - 6*(20*a^3*b^3*c^3*d^
3*g^2*i^3*n^2 - 15*a^4*b^2*c^2*d^4*g^2*i^3*n^2 + 6*a^5*b*c*d^5*g^2*i^3*n^2
- a^6*d^6*g^2*i^3*n^2)*B^2*log(b*x + a)^2 + 12*(b^6*c^6*g^2*i^3*n^2 - 6*a*b
^5*c^5*d*g^2*i^3*n^2 + 15*a^2*b^4*c^4*d^2*g^2*i^3*n^2)*B^2*log(b*x + a)*log
(d*x + c) - 6*(b^6*c^6*g^2*i^3*n^2 - 6*a*b^5*c^5*d*g^2*i^3*n^2 + 15*a^2*b^4
*c^4*d^2*g^2*i^3*n^2)*B^2*log(d*x + c)^2 - 2*(2*(4*g^2*i^3*n^2 - 3*g^2*i^3*
n*log(e))*b^6*c^5*d - 3*(17*g^2*i^3*n^2 - 12*g^2*i^3*n*log(e))*a*b^5*c^4*d^
2 + (97*g^2*i^3*n^2 + 30*g^2*i^3*n*log(e) - 180*g^2*i^3*log(e)^2)*a^2*b^4*c
^3*d^3 - (77*g^2*i^3*n^2 + 90*g^2*i^3*n*log(e))*a^3*b^3*c^2*d^4 + 9*(3*g^2*
i^3*n^2 + 4*g^2*i^3*n*log(e))*a^4*b^2*c*d^5 - 2*(2*g^2*i^3*n^2 + 3*g^2*i^3*
n*log(e))*a^5*b*d^6)*B^2*x + 2*(6*a*b^5*c^5*d*g^2*i^3*n^2 - 33*a^2*b^4*c^4*
d^2*g^2*i^3*n^2 + 2*(17*g^2*i^3*n^2 + 60*g^2*i^3*n*log(e))*a^3*b^3*c^3*d^3
- 3*(g^2*i^3*n^2 + 30*g^2*i^3*n*log(e))*a^4*b^2*c^2*d^4 - 6*(g^2*i^3*n^2 -
6*g^2*i^3*n*log(e))*a^5*b*c*d^5 + 2*(g^2*i^3*n^2 - 3*g^2*i^3*n*log(e))*a^6*
d^6)*B^2*log(b*x + a) + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^4*c^3*
d^3*g^2*i^3*x + 12*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^5 + 15
*(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3)*B^2*
x^4 + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c*d^5*g
^2*i^3)*B^2*x^3 + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2*i^3)*
B^2*x^2)*log((b*x + a)^n)^2 + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^
4*c^3*d^3*g^2*i^3*x + 12*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^
5 + 15*(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3
)*B^2*x^4 + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c
*d^5*g^2*i^3)*B^2*x^3 + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2
*i^3)*B^2*x^2)*log((d*x + c)^n)^2 + 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*log(e) -
12*((g^2*i^3*n - 18*g^2*i^3*log(e))*b^6*c*d^5 - (g^2*i^3*n + 12*g^2*i^3*log
(e))*a*b^5*d^6)*B^2*x^5 - 3*((13*g^2*i^3*n - 90*g^2*i^3*log(e))*b^6*c^2*d^4
- 6*(g^2*i^3*n + 30*g^2*i^3*log(e))*a*b^5*c*d^5 - (7*g^2*i^3*n + 30*g^2*i^
3*log(e))*a^2*b^4*d^6)*B^2*x^4 + 2*(a^3*b^3*d^6*g^2*i^3*n - (19*g^2*i^3*n -
60*g^2*i^3*log(e))*b^6*c^3*d^3 - 3*(7*g^2*i^3*n - 120*g^2*i^3*log(e))*a*b^
5*c^2*d^4 + 3*(13*g^2*i^3*n + 60*g^2*i^3*log(e))*a^2*b^4*c*d^5)*B^2*x^3 - 3
*(b^6*c^4*d^2*g^2*i^3*n - 6*a^3*b^3*c*d^5*g^2*i^3*n + a^4*b^2*d^6*g^2*i^3*n
+ 2*(17*g^2*i^3*n - 60*g^2*i^3*log(e))*a*b^5*c^3*d^3 - 30*(g^2*i^3*n + 6*g
^2*i^3*log(e))*a^2*b^4*c^2*d^4)*B^2*x^2 + 6*(b^6*c^5*d*g^2*i^3*n - 6*a*b^5*
c^4*d^2*g^2*i^3*n + 15*a^3*b^3*c^2*d^4*g^2*i^3*n - 6*a^4*b^2*c*d^5*g^2*i^3*
n + a^5*b*d^6*g^2*i^3*n - 5*(g^2*i^3*n - 12*g^2*i^3*log(e))*a^2*b^4*c^3*d^3
)*B^2*x + 6*(20*a^3*b^3*c^3*d^3*g^2*i^3*n - 15*a^4*b^2*c^2*d^4*g^2*i^3*n +
6*a^5*b*c*d^5*g^2*i^3*n - a^6*d^6*g^2*i^3*n)*B^2*log(b*x + a) - 6*(b^6*c^6*
g^2*i^3*n - 6*a*b^5*c^5*d*g^2*i^3*n + 15*a^2*b^4*c^4*d^2*g^2*i^3*n)*B^2*log
(d*x + c))*log((b*x + a)^n) - 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*log(e) - 12*((g
^2*i^3*n - 18*g^2*i^3*log(e))*b^6*c*d^5 - (g^2*i^3*n + 12*g^2*i^3*log(e))*a
*b^5*d^6)*B^2*x^5 - 3*((13*g^2*i^3*n - 90*g^2*i^3*log(e))*b^6*c^2*d^4 - 6*(
g^2*i^3*n + 30*g^2*i^3*log(e))*a*b^5*c*d^5 - (7*g^2*i^3*n + 30*g^2*i^3*log(
e))*a^2*b^4*d^6)*B^2*x^4 + 2*(a^3*b^3*d^6*g^2*i^3*n - (19*g^2*i^3*n - 60*g^
2*i^3*log(e))*b^6*c^3*d^3 - 3*(7*g^2*i^3*n - 120*g^2*i^3*log(e))*a*b^5*c^2*
d^4 + 3*(13*g^2*i^3*n + 60*g^2*i^3*log(e))*a^2*b^4*c*d^5)*B^2*x^3 - 3*(b^6*
c^4*d^2*g^2*i^3*n - 6*a^3*b^3*c*d^5*g^2*i^3*n + a^4*b^2*d^6*g^2*i^3*n + 2*(
17*g^2*i^3*n - 60*g^2*i^3*log(e))*a*b^5*c^3*d^3 - 30*(g^2*i^3*n + 6*g^2*i^3
*log(e))*a^2*b^4*c^2*d^4)*B^2*x^2 + 6*(b^6*c^5*d*g^2*i^3*n - 6*a*b^5*c^4*d^
2*g^2*i^3*n + 15*a^3*b^3*c^2*d^4*g^2*i^3*n - 6*a^4*b^2*c*d^5*g^2*i^3*n + a^
5*b*d^6*g^2*i^3*n - 5*(g^2*i^3*n - 12*g^2*i^3*log(e))*a^2*b^4*c^3*d^3)*B^2*
x + 6*(20*a^3*b^3*c^3*d^3*g^2*i^3*n - 15*a^4*b^2*c^2*d^4*g^2*i^3*n + 6*a^5*
b*c*d^5*g^2*i^3*n - a^6*d^6*g^2*i^3*n)*B^2*log(b*x + a) - 6*(b^6*c^6*g^2*i^
3*n - 6*a*b^5*c^5*d*g^2*i^3*n + 15*a^2*b^4*c^4*d^2*g^2*i^3*n)*B^2*log(d*x +
c) + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^4*c^3*d^3*g^2*i^3*x + 12
*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^5 + 15*(3*b^6*c^2*d^4*g^

```
2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3)*B^2*x^4 + 20*(b^6*c^3*
d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c*d^5*g^2*i^3)*B^2*x^3 +
30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2*i^3)*B^2*x^2)*log((b*x
+ a)^n))*log((d*x + c)^n))/(b^4*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2d^3g^2i^3x^5 + A^2a^2c^3g^2i^3 + \left(3\,A^2b^2cd^2 + 2\,A^2abd^3\right)g^2i^3x^4 + \left(3\,A^2b^2c^2d + 6\,A^2abcd^2 + A^2a^2d^3\right)g^2i^3x^3 + \left(A^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="fricas")
```

```
[Out] integral(A^2*b^2*d^3*g^2*i^3*x^5 + A^2*a^2*c^3*g^2*i^3 + (3*A^2*b^2*c*d^2 +
 2*A^2*a*b*d^3)*g^2*i^3*x^4 + (3*A^2*b^2*c^2*d + 6*A^2*a*b*c*d^2 + A^2*a^2*
d^3)*g^2*i^3*x^3 + (A^2*b^2*c^3 + 6*A^2*a*b*c^2*d + 3*A^2*a^2*c*d^2)*g^2*i^
3*x^2 + (2*A^2*a*b*c^3 + 3*A^2*a^2*c^2*d)*g^2*i^3*x + (B^2*b^2*d^3*g^2*i^3*
x^5 + B^2*a^2*c^3*g^2*i^3 + (3*B^2*b^2*c*d^2 + 2*B^2*a*b*d^3)*g^2*i^3*x^4 +
 (3*B^2*b^2*c^2*d + 6*B^2*a*b*c*d^2 + B^2*a^2*d^3)*g^2*i^3*x^3 + (B^2*b^2*c
^3 + 6*B^2*a*b*c^2*d + 3*B^2*a^2*c*d^2)*g^2*i^3*x^2 + (2*B^2*a*b*c^3 + 3*B^
2*a^2*c^2*d)*g^2*i^3*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^2*d^3*g
^2*i^3*x^5 + A*B*a^2*c^3*g^2*i^3 + (3*A*B*b^2*c*d^2 + 2*A*B*a*b*d^3)*g^2*i^
3*x^4 + (3*A*B*b^2*c^2*d + 6*A*B*a*b*c*d^2 + A*B*a^2*d^3)*g^2*i^3*x^3 + (A*
B*b^2*c^3 + 6*A*B*a*b*c^2*d + 3*A*B*a^2*c*d^2)*g^2*i^3*x^2 + (2*A*B*a*b*c^3
 + 3*A*B*a^2*c^2*d)*g^2*i^3*x)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^2 (dix + ci)^3 \left(B\log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n)
 + A)^2, x)
```

3.180 $\int (ag+bgx)(ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=786

$$-\frac{B^2gi^3n^2(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{10b^4d^2}-\frac{Bgi^3n(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{10b^4d^2}+\frac{3Bgi^3n(c+d}{}$$

```
[Out] (B^2*(b*c - a*d)^4*g*i^3*n^2*x)/(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*n^2*(
c + d*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g*i^3*n^2*(c + d*x)^3)/(30*b*
d^2) - (B*(b*c - a*d)^4*g*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n]))/(10*b^4*d) - (B*(b*c - a*d)^3*g*i^3*n*(a + b*x)^2*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(10*b^4) + (3*B*(b*c - a*d)^3*g*i^3*n*(c + d*x)^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*
n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b*d^2) - (B*(b*c
- a*d)*g*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*d^2)
 + ((b*c - a*d)^3*g*i^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/(20*b^4) + ((b*c - a*d)^2*g*i^3*(a + b*x)^2*(c + d*x)*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n])^2)/(10*b^3) + (3*(b*c - a*d)*g*i^3*(a + b*x)^2*(c + d*
x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(20*b^2) + (g*i^3*(a + b*x)^
2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) - (B*(b*c - a
*d)^5*g*i^3*n*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/
(b*(c + d*x))])/(10*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*Log[(a + b*x)/(
c + d*x)])/(12*b^4*d^2) - (11*B^2*(b*c - a*d)^5*g*i^3*n^2*Log[c + d*x])/(60
*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d
*x))])/(10*b^4*d^2)
```

Rubi [A] time = 1.92992, antiderivative size = 706, normalized size of antiderivative = 0.9, number of steps used = 52, number of rules used = 13, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.302, Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2gi^3n^2(bc-ad)^5\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{10b^4d^2}+\frac{Bgi^3n(bc-ad)^5\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{10b^4d^2}+\frac{Bgi^3n(c+dx)^2(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,
x]
```

```
[Out] (A*B*(b*c - a*d)^4*g*i^3*n*x)/(10*b^3*d) + (B^2*(b*c - a*d)^4*g*i^3*n^2*x)/
(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*n^2*(c + d*x)^2)/(30*b^2*d^2) + (B^2*
(b*c - a*d)^2*g*i^3*n^2*(c + d*x)^3)/(30*b*d^2) + (B^2*(b*c - a*d)^5*g*i^3*
n^2*Log[a + b*x])/(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*Log[a + b*x]^
2)/(20*b^4*d^2) + (B^2*(b*c - a*d)^4*g*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n])/(10*b^4*d) + (B*(b*c - a*d)^3*g*i^3*n*(c + d*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*n*(c + d*x
)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b*d^2) - (B*(b*c - a*d)*g*i
^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*d^2) + (B*(b*c
 - a*d)^5*g*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*
b^4*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2)/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(5*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*Log[c + d*x])/(10*b^4*d^2) +
(B^2*(b*c - a*d)^5*g*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
```

```
10*b^4*d^2) + (B^2*(b*c - a*d)^5*g*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c
- a*d))])/(10*b^4*d^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (180c+180dx)^3(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx=\int\left(\frac{(-bc+ad)g(180c+180dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d}\right.$$

$$=\frac{(bg)\int(180c+180dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx}{180d}+\frac{((-}{}$$

$$=-\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^2}+$$

$$=-\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^2}+$$

$$=-\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^2}+$$

$$=-\frac{1458000(bc-ad)g(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{d^2}+$$

$$=\frac{583200AB(bc-ad)^4gnx}{b^3d}+\frac{291600B(bc-ad)^3gn(c+dx)}{b^2d^2}$$

$$=\frac{583200AB(bc-ad)^4gnx}{b^3d}+\frac{583200B^2(bc-ad)^4gn(a+bx}{b^4d}$$

$$=\frac{583200AB(bc-ad)^4gnx}{b^3d}+\frac{583200B^2(bc-ad)^4gn(a+bx}{b^4d}$$

$$=\frac{583200AB(bc-ad)^4gnx}{b^3d}+\frac{97200B^2(bc-ad)^4gn^2x}{b^3d}+\frac{19}{}$$

$$=\frac{583200AB(bc-ad)^4gnx}{b^3d}+\frac{97200B^2(bc-ad)^4gn^2x}{b^3d}+\frac{19}{}$$

$$=\frac{583200AB(bc-ad)^4gnx}{b^3d}+\frac{97200B^2(bc-ad)^4gn^2x}{b^3d}+\frac{19}{}$$

Mathematica [A] time = 0.726238, size = 945, normalized size = 1.2

$$\frac{gi^3\left(4b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(c+dx)^5-5(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2(c+dx)^4+\frac{5B(bc-ad)^2n\left(6\log(a+bx)\left(A+B\log\left(e\left(\right.\right.\right.\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2,x]
```

```
[Out] (g*i^3*(-5*(b*c - a*d)*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
 + 4*b*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (5*B*(b*c - a
```

```
*d)^2*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)
*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2
*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*
x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6
*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(b
*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a + b*x
] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
+ a*d)])))/(3*b^4) - (B*(b*c - a*d)*n*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c
 - a*d)^3*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*n*(2*b*d
*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c -
 a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c +
 d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Lo
g[e*((a + b*x)/(c + d*x))^n] + 12*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]) + 8*b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]) + 6*b^4*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 24*(b*c - a*d)^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] - 12*B*(b*c - a*d)^4*n*(Log[a + b*x
]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
b*x))/(-(b*c) + a*d)])))/(3*b^4)))/(20*d^2)
```

Maple [F] time = 0.534, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)(dix + ci)^3 \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 4.63509, size = 5027, normalized size = 6.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 2/5*A*B*b*d^3*g*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*b*
d^3*g*i^3*x^5 + 3/2*A*B*b*c*d^2*g*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) + 1/2*A*B*a*d^3*g*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/
4*A^2*b*c*d^2*g*i^3*x^4 + 1/4*A^2*a*d^3*g*i^3*x^4 + 2*A*B*b*c^2*d*g*i^3*x^3
*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a*c*d^2*g*i^3*x^3*log(e*(b*
x/(d*x + c) + a/(d*x + c))^n) + A^2*b*c^2*d*g*i^3*x^3 + A^2*a*c*d^2*g*i^3*x
^3 + A*B*b*c^3*g*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*A*B*a*c
^2*d*g*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*b*c^3*g*i^3
*x^2 + 3/2*A^2*a*c^2*d*g*i^3*x^2 + 1/30*A*B*b*d^3*g*i^3*n*(12*a^5*log(b*x +
 a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4
*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 -
 a^4*d^4)*x)/(b^4*d^4)) - 1/4*A*B*b*c*d^2*g*i^3*n*(6*a^4*log(b*x + a)/b^4 -
 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a
```

^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/12*A*B*a*d^3*g*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*b*c^2*d*g*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + A*B*a*c*d^2*g*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - A*B*b*c^3*g*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 3*A*B*a*c^2*d*g*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a*c^3*g*i^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*a*c^3*g*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*c^3*g*i^3*x - 1/60*(47*a^2*b^2*c^3*d^2*g*i^3*n^2 - 27*a^3*b*c^2*d^3*g*i^3*n^2 + 6*a^4*c*d^4*g*i^3*n^2 + (5*g*i^3*n^2 - 6*g*i^3*n*log(e))*b^4*c^5 - (31*g*i^3*n^2 - 30*g*i^3*n*log(e))*a*b^3*c^4*d)*B^2*log(d*x + c)/(b^3*d^2) + 1/10*(b^5*c^5*g*i^3*n^2 - 5*a*b^4*c^4*d*g*i^3*n^2 + 10*a^2*b^3*c^3*d^2*g*i^3*n^2 - 10*a^3*b^2*c^2*d^3*g*i^3*n^2 + 5*a^4*b*c*d^4*g*i^3*n^2 - a^5*d^5*g*i^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^2) + 1/60*(12*B^2*b^5*d^5*g*i^3*x^5*log(e)^2 - 3*((2*g*i^3*n*log(e) - 15*g*i^3*log(e)^2)*b^5*c*d^4 - (2*g*i^3*n*log(e) + 5*g*i^3*log(e)^2)*a*b^4*d^5)*B^2*x^4 + 2*((g*i^3*n^2 - 11*g*i^3*n*log(e) + 30*g*i^3*log(e)^2)*b^5*c^2*d^3 - 2*(g*i^3*n^2 - 5*g*i^3*n*log(e) - 15*g*i^3*log(e)^2)*a*b^4*c*d^4 + (g*i^3*n^2 + g*i^3*n*log(e))*a^2*b^3*d^5)*B^2*x^3 + ((8*g*i^3*n^2 - 27*g*i^3*n*log(e) + 30*g*i^3*log(e)^2)*b^5*c^3*d^2 - 3*(6*g*i^3*n^2 - 5*g*i^3*n*log(e) - 30*g*i^3*log(e)^2)*a*b^4*c^2*d^3 + 3*(4*g*i^3*n^2 + 5*g*i^3*n*log(e))*a^2*b^3*c*d^4 - (2*g*i^3*n^2 + 3*g*i^3*n*log(e))*a^3*b^2*d^5)*B^2*x^2 - 3*(10*a^2*b^3*c^3*d^2*g*i^3*n^2 - 10*a^3*b^2*c^2*d^3*g*i^3*n^2 + 5*a^4*b*c*d^4*g*i^3*n^2 - a^5*d^5*g*i^3*n^2)*B^2*log(b*x + a)^2 - 6*(b^5*c^5*g*i^3*n^2 - 5*a*b^4*c^4*d*g*i^3*n^2)*B^2*log(b*x + a)*log(d*x + c) + 3*(b^5*c^5*g*i^3*n^2 - 5*a*b^4*c^4*d*g*i^3*n^2)*B^2*log(d*x + c)^2 + ((11*g*i^3*n^2 - 6*g*i^3*n*log(e))*b^5*c^4*d - 2*(14*g*i^3*n^2 + 15*g*i^3*n*log(e) - 30*g*i^3*log(e)^2)*a*b^4*c^3*d^2 + 12*(2*g*i^3*n^2 + 5*g*i^3*n*log(e))*a^2*b^3*c^2*d^3 - 2*(4*g*i^3*n^2 + 15*g*i^3*n*log(e))*a^3*b^2*c*d^4 + (g*i^3*n^2 + 6*g*i^3*n*log(e))*a^4*b*d^5)*B^2*x - (6*a*b^4*c^4*d*g*i^3*n^2 + 3*(g*i^3*n^2 - 20*g*i^3*n*log(e))*a^2*b^3*c^3*d^2 - (23*g*i^3*n^2 - 60*g*i^3*n*log(e))*a^3*b^2*c^2*d^3 + (19*g*i^3*n^2 - 30*g*i^3*n*log(e))*a^4*b*c*d^4 - (5*g*i^3*n^2 - 6*g*i^3*n*log(e))*a^5*d^5)*B^2*log(b*x + a) + 3*(4*B^2*b^5*d^5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10*(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2)*log((b*x + a)^n)^2 + 3*(4*B^2*b^5*d^5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10*(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2)*log((d*x + c)^n)^2 + (24*B^2*b^5*d^5*g*i^3*x^5*log(e) - 6*((g*i^3*n - 15*g*i^3*log(e))*b^5*c*d^4 - (g*i^3*n + 5*g*i^3*log(e))*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g*i^3*n - (11*g*i^3*n - 60*g*i^3*log(e))*b^5*c^2*d^3 + 10*(g*i^3*n + 6*g*i^3*log(e))*a*b^4*c*d^4)*B^2*x^3 + 3*(5*a^2*b^3*c*d^4*g*i^3*n - a^3*b^2*d^5*g*i^3*n - (9*g*i^3*n - 20*g*i^3*log(e))*b^5*c^3*d^2 + 5*(g*i^3*n + 12*g*i^3*log(e))*a*b^4*c^2*d^3)*B^2*x^2 - 6*(b^5*c^4*d*g*i^3*n - 10*a^2*b^3*c^2*d^3*g*i^3*n + 5*a^3*b^2*c*d^4*g*i^3*n - a^4*b*d^5*g*i^3*n + 5*(g*i^3*n - 4*g*i^3*log(e))*a*b^4*c^3*d^2)*B^2*x + 6*(10*a^2*b^3*c^3*d^2*g*i^3*n - 10*a^3*b^2*c^2*d^3*g*i^3*n + 5*a^4*b*c*d^4*g*i^3*n - a^5*d^5*g*i^3*n)*B^2*log(b*x + a) + 6*(b^5*c^5*g*i^3*n - 5*a*b^4*c^4*d*g*i^3*n)*B^2*log(d*x + c))*log((b*x + a)^n) - (24*B^2*b^5*d^5*g*i^3*x^5*log(e) - 6*((g*i^3*n - 15*g*i^3*log(e))*b^5*c*d^4 - (g*i^3*n + 5*g*i^3*log(e))*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g*i^3*n - (11*g*i^3*n - 60*g*i^3*log(e))*b^5*c^2*d^3 + 10*(g*i^3*n + 6*g*i^3*log(e))*a*b^4*c*d^4)*B^2*x^3 + 3*(5*a^2*b^3*c*d^4*g*i^3*n - a^3*b^2*d^5*g*i^3*n - (9*g*i^3*n - 20*g*i^3*log(e))*b^5*c^3*d^2 + 5*(g*i^3*n + 12*g*i^3*log(e))*a*b^4*c^2*d^3)*B^2*x^2 - 6*(b^5*c^4*d*g*i^3*n - 10*a^2*b^3*c^2*d^3*g*i^3*n + 5*a^3*b^2*c*d^4*g*i^3*n - a^4*b*d^5*g*i^3*n + 5*(g*i^3*n - 4

```
*g*i^3*log(e))*a*b^4*c^3*d^2)*B^2*x + 6*(10*a^2*b^3*c^3*d^2*g*i^3*n - 10*a^
3*b^2*c^2*d^3*g*i^3*n + 5*a^4*b*c*d^4*g*i^3*n - a^5*d^5*g*i^3*n)*B^2*log(b*
x + a) + 6*(b^5*c^5*g*i^3*n - 5*a*b^4*c^4*d*g*i^3*n)*B^2*log(d*x + c) + 6*(
4*B^2*b^5*d^5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i
^3 + a*b^4*d^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*
B^2*x^3 + 10*(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2)*log((b*x
+ a)^n))*log((d*x + c)^n))/(b^4*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bd^3gi^3x^4 + A^2ac^3gi^3 + \left(3\,A^2bcd^2 + A^2ad^3\right)gi^3x^3 + 3\left(A^2bc^2d + A^2acd^2\right)gi^3x^2 + \left(A^2bc^3 + 3\,A^2ac^2d\right)gi^3x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] integral(A^2*b*d^3*g*i^3*x^4 + A^2*a*c^3*g*i^3 + (3*A^2*b*c*d^2 + A^2*a*d^3
)*g*i^3*x^3 + 3*(A^2*b*c^2*d + A^2*a*c*d^2)*g*i^3*x^2 + (A^2*b*c^3 + 3*A^2*
a*c^2*d)*g*i^3*x + (B^2*b*d^3*g*i^3*x^4 + B^2*a*c^3*g*i^3 + (3*B^2*b*c*d^2
+ B^2*a*d^3)*g*i^3*x^3 + 3*(B^2*b*c^2*d + B^2*a*c*d^2)*g*i^3*x^2 + (B^2*b*c
^3 + 3*B^2*a*c^2*d)*g*i^3*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b*d^
3*g*i^3*x^4 + A*B*a*c^3*g*i^3 + (3*A*B*b*c*d^2 + A*B*a*d^3)*g*i^3*x^3 + 3*(
A*B*b*c^2*d + A*B*a*c*d^2)*g*i^3*x^2 + (A*B*b*c^3 + 3*A*B*a*c^2*d)*g*i^3*x)
*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)(dix + ci)^3\left(B\log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) +
 A)^2, x)
```

3.181 $\int (ci+dix)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=454

$$-\frac{B^2i^3n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{2b^4d}+\frac{Bi^3n(bc-ad)^4\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4d}-\frac{Bi^3n(a+bx)(bc-ad}{}$$

```
[Out] (5*B^2*(b*c - a*d)^3*i^3*n^2*x)/(12*b^3) + (B^2*(b*c - a*d)^2*i^3*n^2*(c +
d*x)^2)/(12*b^2*d) - (B*(b*c - a*d)^3*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(2*b^4) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(4*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) + (i^3*(c + d*x)^4*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^2)/(4*d) + (5*B^2*(b*c - a*d)^4*i^3*n^2*Log[(
a + b*x)/(c + d*x)])/(12*b^4*d) + (11*B^2*(b*c - a*d)^4*i^3*n^2*Log[c + d*x
])/(12*b^4*d) + (B*(b*c - a*d)^4*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(2*b^4*d) - (B^2*(b*c - a*d)^4*i^3
*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(2*b^4*d)
```

Rubi [A] time = 0.663842, antiderivative size = 544, normalized size of antiderivative = 1.2, number of steps used = 23, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{B^2i^3n^2(bc-ad)^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2b^4d}-\frac{Bi^3n(bc-ad)^4\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4d}-\frac{Bi^3n(c+dx)^2(bc-ad)^2}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*i^3*n*x)/(2*b^3) + (5*B^2*(b*c - a*d)^3*i^3*n^2*x)/(12*
b^3) + (B^2*(b*c - a*d)^2*i^3*n^2*(c + d*x)^2)/(12*b^2*d) + (5*B^2*(b*c - a
*d)^4*i^3*n^2*Log[a + b*x])/(12*b^4*d) + (B^2*(b*c - a*d)^4*i^3*n^2*Log[a +
 b*x]^2)/(4*b^4*d) - (B^2*(b*c - a*d)^3*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n])/(2*b^4) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(4*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) - (B*(b*c - a*d)^4*i^3*n*Log[a + b
*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*d) + (i^3*(c + d*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*d) + (B^2*(b*c - a*d)^4*i^3*n^2*
Log[c + d*x])/(2*b^4*d) - (B^2*(b*c - a*d)^4*i^3*n^2*Log[a + b*x]*Log[(b*(c
 + d*x))/(b*c - a*d)])/(2*b^4*d) - (B^2*(b*c - a*d)^4*i^3*n^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(2*b^4*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (181c+181dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx=\frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-(Bn)\int\frac{1073283121(bc-ad)\ldots}{3\ldots}$$

$$=\frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-\frac{(5929741B(bc-ad)n)\ldots}{\ldots}$$

$$=\frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-\frac{(5929741B(bc-ad)n)\ldots}{\ldots}$$

$$=\frac{5929741(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-\frac{(5929741B(bc-ad)n)\ldots}{\ldots}$$

$$=-\frac{5929741AB(bc-ad)^3nx}{2b^3}-\frac{5929741B(bc-ad)^2n(c+dx)^2\left(A+B\ldots\right.}{4b^2d}$$

$$=-\frac{5929741AB(bc-ad)^3nx}{2b^3}-\frac{5929741B^2(bc-ad)^3n(a+bx)\log\left(e\left(\ldots\right.\right.}{2b^4}$$

$$=-\frac{5929741AB(bc-ad)^3nx}{2b^3}-\frac{5929741B^2(bc-ad)^3n(a+bx)\log\left(e\left(\ldots\right.\right.}{2b^4}$$

$$=-\frac{5929741AB(bc-ad)^3nx}{2b^3}+\frac{29648705B^2(bc-ad)^3n^2x}{12b^3}+\frac{5929741\ldots}{\ldots}$$

$$=-\frac{5929741AB(bc-ad)^3nx}{2b^3}+\frac{29648705B^2(bc-ad)^3n^2x}{12b^3}+\frac{5929741\ldots}{\ldots}$$

$$=-\frac{5929741AB(bc-ad)^3nx}{2b^3}+\frac{29648705B^2(bc-ad)^3n^2x}{12b^3}+\frac{5929741\ldots}{\ldots}$$

Mathematica [A] time = 0.321483, size = 409, normalized size = 0.9

$$i^3\left((c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2-\frac{Bn(bc-ad)\left(-3Bn(bc-ad)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+3b^2(c+dx)^2(b\cdots}{\cdots}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (i^3*((c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)*Log[
a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c
 - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*(b*c
 - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(b*c -
a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a + b*x] - 2
*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)]))))/(3*b^4)))/(4*d)
```

Maple [F] time = 0.51, size = 0, normalized size = 0.

$$\int (dix+ci)^3\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.78814, size = 2874, normalized size = 6.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 1/2*A*B*d^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*d^3*i^
3*x^4 + 2*A*B*c*d^2*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*
d^2*i^3*x^3 + 3*A*B*c^2*d*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
3/2*A^2*c^2*d*i^3*x^2 - 1/12*A*B*d^3*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*
log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^
3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*c*d^2*i^3*n*(2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*c^2*d*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*c^3*i^3*n*(a*log(b*x + a)/b
 - c*log(d*x + c)/d) + 2*A*B*c^3*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n) + A^2*c^3*i^3*x - 1/12*(26*a*b^2*c^3*d*i^3*n^2 - 21*a^2*b*c^2*d^2*i^3*n^
2 + 6*a^3*c*d^3*i^3*n^2 - (11*i^3*n^2 - 6*i^3*n*log(e))*b^3*c^4)*B^2*log(d*
```

```
x + c)/(b^3*d) - 1/2*(b^4*c^4*i^3*n^2 - 4*a*b^3*c^3*d*i^3*n^2 + 6*a^2*b^2*c
^2*d^2*i^3*n^2 - 4*a^3*b*c*d^3*i^3*n^2 + a^4*d^4*i^3*n^2)*(log(b*x + a)*log
((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b
^4*d) + 1/12*(3*B^2*b^4*d^4*i^3*x^4*log(e)^2 + 6*B^2*b^4*c^4*i^3*n^2*log(b*
x + a)*log(d*x + c) - 3*B^2*b^4*c^4*i^3*n^2*log(d*x + c)^2 + 2*(a*b^3*d^4*i
^3*n*log(e) - (i^3*n*log(e) - 6*i^3*log(e)^2)*b^4*c*d^3)*B^2*x^3 + ((i^3*n^
2 - 9*i^3*n*log(e) + 18*i^3*log(e)^2)*b^4*c^2*d^2 - 2*(i^3*n^2 - 6*i^3*n*lo
g(e))*a*b^3*c*d^3 + (i^3*n^2 - 3*i^3*n*log(e))*a^2*b^2*d^4)*B^2*x^2 - 3*(4*
a*b^3*c^3*d*i^3*n^2 - 6*a^2*b^2*c^2*d^2*i^3*n^2 + 4*a^3*b*c*d^3*i^3*n^2 - a
^4*d^4*i^3*n^2)*B^2*log(b*x + a)^2 + ((7*i^3*n^2 - 18*i^3*n*log(e) + 12*i^3
*log(e)^2)*b^4*c^3*d - (19*i^3*n^2 - 36*i^3*n*log(e))*a*b^3*c^2*d^2 + (17*i
^3*n^2 - 24*i^3*n*log(e))*a^2*b^2*c*d^3 - (5*i^3*n^2 - 6*i^3*n*log(e))*a^3*
b*d^4)*B^2*x - (6*(3*i^3*n^2 - 4*i^3*n*log(e))*a*b^3*c^3*d - 9*(5*i^3*n^2 -
 4*i^3*n*log(e))*a^2*b^2*c^2*d^2 + 2*(19*i^3*n^2 - 12*i^3*n*log(e))*a^3*b*c
*d^3 - (11*i^3*n^2 - 6*i^3*n*log(e))*a^4*d^4)*B^2*log(b*x + a) + 3*(B^2*b^4
*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*
b^4*c^3*d*i^3*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*
d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x)*log((d*x +
 c)^n)^2 + (6*B^2*b^4*d^4*i^3*x^4*log(e) - 6*B^2*b^4*c^4*i^3*n*log(d*x + c)
 + 2*(a*b^3*d^4*i^3*n - (i^3*n - 12*i^3*log(e))*b^4*c*d^3)*B^2*x^3 + 3*(4*a
*b^3*c*d^3*i^3*n - a^2*b^2*d^4*i^3*n - 3*(i^3*n - 4*i^3*log(e))*b^4*c^2*d^2
)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*i^3*n - 4*a^2*b^2*c*d^3*i^3*n + a^3*b*d^4*i^
3*n - (3*i^3*n - 4*i^3*log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*c^3*d*i^3*n -
6*a^2*b^2*c^2*d^2*i^3*n + 4*a^3*b*c*d^3*i^3*n - a^4*d^4*i^3*n)*B^2*log(b*x
+ a))*log((b*x + a)^n) - (6*B^2*b^4*d^4*i^3*x^4*log(e) - 6*B^2*b^4*c^4*i^3*
n*log(d*x + c) + 2*(a*b^3*d^4*i^3*n - (i^3*n - 12*i^3*log(e))*b^4*c*d^3)*B^
2*x^3 + 3*(4*a*b^3*c*d^3*i^3*n - a^2*b^2*d^4*i^3*n - 3*(i^3*n - 4*i^3*log(e
))*b^4*c^2*d^2)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*i^3*n - 4*a^2*b^2*c*d^3*i^3*n
+ a^3*b*d^4*i^3*n - (3*i^3*n - 4*i^3*log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*
c^3*d*i^3*n - 6*a^2*b^2*c^2*d^2*i^3*n + 4*a^3*b*c*d^3*i^3*n - a^4*d^4*i^3*n
)*B^2*log(b*x + a) + 6*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B
^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x)*log((b*x + a)^n))*log((d*x
+ c)^n))/(b^4*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c^
3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c^
3*i^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*
i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n),
x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)^3 \left(B \log\left(e \left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.182 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=762

$$\frac{2Bi^3n(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g}+\frac{2B^2i^3n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g}-\frac{5B^2i^3n^2(bc-ad}{}$$

```
[Out] (B^2*d*(b*c - a*d)^2*i^3*n^2*x)/(3*b^3*g) - (5*B*d*(b*c - a*d)^2*i^3*n*(a +
 b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g) - (B*(b*c - a*d)*i^
3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*g) + (d*(b*c
 - a*d)^2*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g) +
 ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*
b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b*g)
 + (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c
 - a*d)/(b*(c + d*x))])/(b^4*g) + (B^2*(b*c - a*d)^3*i^3*n^2*Log[(a + b*x)/
(c + d*x)])/(3*b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*n^2*Log[c + d*x])/(b^4*g)
+ (5*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (
b*(c + d*x))/(d*(a + b*x))])/(3*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (
2*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g
) - (5*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
3*b^4*g) + (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*
PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3
*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)
```

Rubi [B] time = 5.62427, antiderivative size = 1995, normalized size of antiderivative = 2.62, number of steps used = 101, number of rules used = 28, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.622, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31, 43}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
),x]
```

```
[Out] (-5*A*B*d*(b*c - a*d)^2*i^3*n*x)/(3*b^3*g) + (B^2*d*(b*c - a*d)^2*i^3*n^2*x
)/(3*b^3*g) + (B^2*(b*c - a*d)^3*i^3*n^2*Log[a + b*x])/(3*b^4*g) - (a*B^2*d
*(b*c - a*d)^2*i^3*n^2*Log[a + b*x]^2)/(b^4*g) + (5*B^2*(b*c - a*d)^3*i^3*n
^2*Log[a + b*x]^2)/(6*b^4*g) - (A*B*(b*c - a*d)^3*i^3*n*Log[g*(a + b*x)]^2)
/(b^4*g) + (B^2*(b*c - a*d)^3*i^3*n^2*Log[g*(a + b*x)]^3)/(3*b^4*g) - (B^2*
(b*c - a*d)^3*i^3*n^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(b^4*g) + (2*B^2*(b
*c - a*d)^3*i^3*n*Log[g*(a + b*x)]*Log[(a + b*x)^n]*Log[-c - d*x])/(b^4*g)
- (B^2*(b*c - a*d)^3*i^3*Log[(a + b*x)^n]^2*Log[-c - d*x])/(b^4*g) - (5*B^2
*d*(b*c - a*d)^2*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(3*b^4*g)
- (B*(b*c - a*d)*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(3*b^2*g) + (2*a*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(b^4*g) - (5*B*(b*c - a*d)^3*i^3*n*Log[a + b*x]*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g) + (d*(b*c - a*d)^2*i^3*x*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B
```

```
*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b*g) + (5*B^2*(b*c - a*d)^3*i^3*n^2*
Log[c + d*x])/(3*b^4*g) + (2*B^2*c*(b*c - a*d)^2*i^3*n^2*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x])/(b^3*g) - (2*B*c*(b*c - a*d)^2*i^3*n*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^3*g) - (B^2*c*(b*c - a*d)^2
*i^3*n^2*Log[c + d*x]^2)/(b^3*g) + (2*a*B^2*d*(b*c - a*d)^2*i^3*n^2*Log[a +
 b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*n^
2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^4*g) + (B^2*(b*c - a*d)
^3*i^3*n^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) + (B^
2*(b*c - a*d)^3*i^3*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4
*g) + (B^2*(b*c - a*d)^3*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x
)^(-n)]^2)/(b^4*g) - (B^2*(b*c - a*d)^3*i^3*Log[g*(a + b*x)]*Log[(c + d*x)^
(-n)]^2)/(b^4*g) + ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2*Log[a*g + b*g*x])/(b^4*g) + (2*A*B*(b*c - a*d)^3*i^3*n*Log[(b*(c + d*x)
)/(b*c - a*d)]*Log[a*g + b*g*x])/(b^4*g) - (2*B^2*(b*c - a*d)^3*i^3*n*Log[(
b*(c + d*x))/(b*c - a*d)]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n
] + Log[(c + d*x)^(-n)])*Log[a*g + b*g*x])/(b^4*g) - (B^2*(b*c - a*d)^3*i^3
*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[a*g + b*g*x]^2)/(b^4*g) - (B^2*(b*c -
 a*d)^3*i^3*n^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b^4*g)
+ (2*A*B*(b*c - a*d)^3*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4
*g) + (2*a*B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(3*b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*n*Log[(a + b*x)^n]*PolyLog
[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) - (2*B^2*(b*c - a*d)^3*i^3*n*(Lo
g[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*Poly
Log[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) + (2*B^2*c*(b*c - a*d)^2*i^3*
n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g) - (2*B^2*(b*c - a*d)^3*i
^3*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^4*g) - (
2*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(b^4*
g) - (2*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(b
^4*g)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
```

```
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(182c+182dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx = \int\left(\frac{6028568d(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{33124d(bc-a\ldots}{\ldots}\right.$$

$$= \frac{\left(6028568(bc-ad)^3\right)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}dx}{b^3} + \frac{(182d)\int(182c+18\ldots}{\ldots}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(bc-ad\ldots}{\ldots}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(bc-ad\ldots}{\ldots}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(bc-ad\ldots}{\ldots}$$

$$= \frac{6028568d(bc-ad)^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g} + \frac{3014284(bc-ad\ldots}{\ldots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} - \frac{6028568B(bc-ad)n(c+dx)^2\left(A+\ldots\right.}{3b^2g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} - \frac{30142840B^2d(bc-ad)^2n(a+bx)\,\mathrm{lo}\ldots}{3b^4g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} - \frac{30142840B^2d(bc-ad)^2n(a+bx)\,\mathrm{lo}\ldots}{3b^4g}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2x}{3b^3g} + \frac{60285\ldots}{\ldots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2x}{3b^3g} + \frac{60285\ldots}{\ldots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2x}{3b^3g} + \frac{60285\ldots}{\ldots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2x}{3b^3g} + \frac{60285\ldots}{\ldots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2x}{3b^3g} + \frac{60285\ldots}{\ldots}$$

$$= -\frac{30142840ABd(bc-ad)^2nx}{3b^3g} + \frac{6028568B^2d(bc-ad)^2n^2x}{3b^3g} + \frac{60285\ldots}{\ldots}$$

Mathematica [B] time = 4.9175, size = 2941, normalized size = 3.86

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x),x]
```

```
[Out] (i^3*(6*b*d*(3*b^2*c^2 - 3*a*b*c*d + a^2*d^2)*x*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 3*b^2*d^2*(3*b*c - a*d)*x^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 2
*b^3*d^3*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
 d*x)])^2 + 6*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))
^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - 18*b^2*B*c^2*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(a*d*Log[a/b + x]^2 - 2*a
*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c +
a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)]) + (-(b*d*x) + a*d
*Log[a + b*x])*Log[(a + b*x)/(c + d*x)]) - 2*a*d*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)]) - 2*B*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a +
b*x)/(c + d*x)])*(6*a^2*b*c*d^2 - 6*a^3*d^3 + 2*b^3*c^2*d*x + 3*a*b^2*c*d^2
*x - 5*a^2*b*d^3*x - b^3*c*d^2*x^2 + a*b^2*d^3*x^2 - 3*a^3*d^3*Log[a/b + x]
^2 - 6*a^2*b*c*d^2*Log[c/d + x] + 5*a^3*d^3*Log[a + b*x] - 6*a^3*d^3*Log[c/
d + x]*Log[a + b*x] + 6*a^3*d^3*Log[a/b + x]*(1 + Log[a + b*x]) + 6*a^3*d^3
*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 6*a^2*b*d^3*x*Log[(a + b*
x)/(c + d*x)] - 3*a*b^2*d^3*x^2*Log[(a + b*x)/(c + d*x)] + 2*b^3*d^3*x^3*Lo
g[(a + b*x)/(c + d*x)] - 6*a^3*d^3*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] -
2*b^3*c^3*Log[c + d*x] - 3*a*b^2*c^2*d*Log[c + d*x] + 6*a^3*d^3*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)]) + 6*b^3*B*c^3*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Lo
g[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) - 2*(Log[c/d + x]*Log
[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) +
9*b*B*c*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*
x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2 + 4
*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*Log
[a/b + x] - 2*a^2*Log[a + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[a + b
*x])*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) + b^2*(d*x*(-
2*c + d*x) - 2*d^2*x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[
c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])) + 6*b^2*B^2*c^2*n^2*(Log[(a + b*x)/(c + d*x)]*(-(a*d*Log[(a + b*x
)/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(a
 + b*x)/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c -
 a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) - 3*b*B^2*c*n^2*(6*b^2*c
^2*Log[(b*c - a*d)/(c + d*x)] - 12*a*b*c*d*Log[(b*c - a*d)/(c + d*x)] + 6*a
^2*d^2*Log[(b*c - a*d)/(c + d*x)] + 6*a*b*c*d*Log[(a + b*x)/(c + d*x)] - 6*
a^2*d^2*Log[(a + b*x)/(c + d*x)] + 6*b^2*c*d*x*Log[(a + b*x)/(c + d*x)] - 6
*a*b*d^2*x*Log[(a + b*x)/(c + d*x)] + 9*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2
+ 6*a*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2 - 3*b^2*d^2*x^2*Log[(a + b*x)/(c +
 d*x)]^2 - 2*a^2*d^2*Log[(a + b*x)/(c + d*x)]^3 + 6*b^2*c^2*Log[(a + b*x)/(
c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b*c*d*Log[(a + b*x)/(c + d*
x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 18*a^2*d^2*Log[(a + b*x)/(c + d*x)]*Lo
g[(b*c - a*d)/(b*c + b*d*x)] + 6*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*
c - a*d)/(b*c + b*d*x)] + 6*(b^2*c^2 + 2*a*b*c*d - 3*a^2*d^2 + 2*a^2*d^2*Lo
g[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*d^
2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) + B^2*n^2*(2*b^3*c^3 - 4*a*b^2*c
^2*d + 2*a^2*b*c*d^2 + 2*b^3*c^2*d*x - 4*a*b^2*c*d^2*x + 2*a^2*b*d^3*x + 6*
b^3*c^3*Log[(b*c - a*d)/(c + d*x)] - 18*a^2*b*c*d^2*Log[(b*c - a*d)/(c + d*
x)] + 12*a^3*d^3*Log[(b*c - a*d)/(c + d*x)] + 4*a*b^2*c^2*d*Log[(a + b*x)/(
```

```
c + d*x)] + 8*a^2*b*c*d^2*Log[(a + b*x)/(c + d*x)] - 12*a^3*d^3*Log[(a + b*
x)/(c + d*x)] + 4*b^3*c^2*d*x*Log[(a + b*x)/(c + d*x)] + 6*a*b^2*c*d^2*x*Lo
g[(a + b*x)/(c + d*x)] - 10*a^2*b*d^3*x*Log[(a + b*x)/(c + d*x)] - 2*b^3*c*
d^2*x^2*Log[(a + b*x)/(c + d*x)] + 2*a*b^2*d^3*x^2*Log[(a + b*x)/(c + d*x)]
 + 11*a^3*d^3*Log[(a + b*x)/(c + d*x)]^2 + 6*a^2*b*d^3*x*Log[(a + b*x)/(c +
 d*x)]^2 - 3*a*b^2*d^3*x^2*Log[(a + b*x)/(c + d*x)]^2 + 2*b^3*d^3*x^3*Log[(
a + b*x)/(c + d*x)]^2 - 2*a^3*d^3*Log[(a + b*x)/(c + d*x)]^3 + 4*b^3*c^3*Lo
g[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*a*b^2*c^2*d*Log[(
a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a^2*b*c*d^2*Log[(a
+ b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 22*a^3*d^3*Log[(a + b*x)
/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*a^3*d^3*Log[(a + b*x)/(c + d
*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*(2*b^3*c^3 + 3*a*b^2*c^2*d + 6*a^
2*b*c*d^2 - 11*a^3*d^3 + 6*a^3*d^3*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*
(a + b*x))/(b*(c + d*x))] - 12*a^3*d^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x
))]) - 6*b^3*B^2*c^3*n^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(a + b*x)/(
c + d*x)]^2 - 2*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b
*x))] - 2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])))/(6*b^4*g)
```

Maple [F] time = 0.672, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{bgx + ag} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="maxima")
```

```
[Out] 3*A^2*c^2*d*i^3*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/6*A^2*d^3*i^3*(6*a^3
*log(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) + 3/2*A^
2*c*d^2*i^3*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A^2*c^
3*i^3*log(b*g*x + a*g)/(b*g) + 1/6*(2*B^2*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^2*
i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2
*b*d^3*i^3)*B^2*x + 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3
- a^3*d^3*i^3)*B^2*log(b*x + a))*log((d*x + c)^n)^2/(b^4*g) - integrate(-1/
3*(3*B^2*b^4*c^4*i^3*log(e)^2 + 6*A*B*b^4*c^4*i^3*log(e) + 3*(B^2*b^4*d^4*i
^3*log(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))*x^4 + 12*(B^2*b^4*c*d^3*i^3*log(e)^
2 + 2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 18*(B^2*b^4*c^2*d^2*i^3*log(e)^2 + 2*
A*B*b^4*c^2*d^2*i^3*log(e))*x^2 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*
i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i
^3)*log((b*x + a)^n)^2 + 12*(B^2*b^4*c^3*d*i^3*log(e)^2 + 2*A*B*b^4*c^3*d*i
^3*log(e))*x + 6*(B^2*b^4*c^4*i^3*log(e) + A*B*b^4*c^4*i^3 + (B^2*b^4*d^4*i
^3*log(e) + A*B*b^4*d^4*i^3)*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*
d^3*i^3)*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d^2*i^3)*x^2 + 4
```

```
*(B^2*b^4*c^3*d*i^3*log(e) + A*B*b^4*c^3*d*i^3)*x)*log((b*x + a)^n) - (6*B^
2*b^4*c^4*i^3*log(e) + 6*A*B*b^4*c^4*i^3 + 2*(3*A*B*b^4*d^4*i^3 + (i^3*n +
3*i^3*log(e))*B^2*b^4*d^4)*x^4 + (24*A*B*b^4*c*d^3*i^3 - (a*b^3*d^4*i^3*n -
 3*(3*i^3*n + 8*i^3*log(e))*b^4*c*d^3)*B^2)*x^3 + 3*(12*A*B*b^4*c^2*d^2*i^3
 - (3*a*b^3*c*d^3*i^3*n - a^2*b^2*d^4*i^3*n - 6*(i^3*n + 2*i^3*log(e))*b^4*
c^2*d^2)*B^2)*x^2 + 6*(4*A*B*b^4*c^3*d*i^3 + (3*a*b^3*c^2*d^2*i^3*n - 3*a^2
*b^2*c*d^3*i^3*n + a^3*b*d^4*i^3*n + 4*b^4*c^3*d*i^3*log(e))*B^2)*x + 6*((b
^4*c^3*d*i^3*n - 3*a*b^3*c^2*d^2*i^3*n + 3*a^2*b^2*c*d^3*i^3*n - a^3*b*d^4*
i^3*n)*B^2*x + (a*b^3*c^3*d*i^3*n - 3*a^2*b^2*c^2*d^2*i^3*n + 3*a^3*b*c*d^3
*i^3*n - a^4*d^4*i^3*n)*B^2)*log(b*x + a) + 6*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*
b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2
*b^4*c^4*i^3)*log((b*x + a)^n))*log((d*x + c)^n))/(b^5*d*g*x^2 + a*b^4*c*g
+ (b^5*c*g + a*b^4*d*g)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right.}{bgx + ag}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2
*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n))
/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{bgx + ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g), x)
```

3.183 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=739

$$\frac{6Bdi^3n(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^2}+\frac{4B^2di^3n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^2}-\frac{B^2di^3n^2(bc-$$

```
[Out] (-2*B^2*(b*c - a*d)^2*i^3*n^2*(c + d*x))/(b^3*g^2*(a + b*x)) - (B*d^2*(b*c
- a*d)*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) -
(2*B*(b*c - a*d)^2*i^3*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^3*g^2*(a + b*x)) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])^2)/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^2) + (4*B*d*(b*c - a*d)^2*i^
3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/
(b^4*g^2) + (B^2*d*(b*c - a*d)^2*i^3*n^2*Log[c + d*x])/(b^4*g^2) + (B*d*(b*
c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x
))/(d*(a + b*x))])/(b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (4*B^
2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^2
) - (B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(
b^4*g^2) + (6*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B^2*d*(b*c - a*d)
^2*i^3*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)
```

Rubi [B] time = 4.73816, antiderivative size = 1875, normalized size of antiderivative = 2.54, number of steps used = 83, number of rules used = 23, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.511, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^2,x]
```

```
[Out] -((A*B*d^2*(b*c - a*d)*i^3*n*x)/(b^3*g^2)) - (2*B^2*(b*c - a*d)^3*i^3*n^2)/
(b^4*g^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*Log[a + b*x])/(b^4*g^2
) - (3*A*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]^2)/(b^4*g^2) + (a^2*B^2*d^3*i
^3*n^2*Log[a + b*x]^2)/(2*b^4*g^2) - (a*B^2*d^2*(3*b*c - 2*a*d)*i^3*n^2*Log
[a + b*x]^2)/(b^4*g^2) + (B^2*d*(b*c - a*d)^2*i^3*n^2*Log[a + b*x]^2)/(b^4*
g^2) - (B^2*d^2*(b*c - a*d)*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])
/(b^4*g^2) - (3*B^2*d*(b*c - a*d)^2*i^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*L
og[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^2) - (3*B^2*d*(b*c - a*d)^2*i^3*Log
[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^2) - (2*B*(b*c - a*d)^3*
i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2*(a + b*x)) - (a^2*B*
d^3*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) +
(2*a*B*d^2*(3*b*c - 2*a*d)*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(b^4*g^2) - (2*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) + (d^2*(3*b*c - 2*a*d)*i^3*x*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2) + (d^3*i^3*x^2*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2)/(2*b^2*g^2) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a
```

```
 + b*x)/(c + d*x))^n])^2)/(b^4*g^2*(a + b*x)) + (3*d*(b*c - a*d)^2*i^3*Log[
a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^2) + (3*B^2*d*(b*
c - a*d)^2*i^3*n^2*Log[c + d*x])/(b^4*g^2) - (B^2*c^2*d*i^3*n^2*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*g^2) + (2*B^2*c*d*(3*b*c - 2*a*d)
*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^2) - (2*B^2
*d*(b*c - a*d)^2*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b
^4*g^2) + (B*c^2*d*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x
])/(b^2*g^2) - (2*B*c*d*(3*b*c - 2*a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])*Log[c + d*x])/(b^3*g^2) + (2*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^4*g^2) + (B^2*c^2*d*i^3*n^2*Log
[c + d*x]^2)/(2*b^2*g^2) - (B^2*c*d*(3*b*c - 2*a*d)*i^3*n^2*Log[c + d*x]^2)
/(b^3*g^2) + (B^2*d*(b*c - a*d)^2*i^3*n^2*Log[c + d*x]^2)/(b^4*g^2) + (6*A*
B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g
^2) - (a^2*B^2*d^3*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^
4*g^2) + (2*a*B^2*d^2*(3*b*c - 2*a*d)*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x)
)/(b*c - a*d)])/(b^4*g^2) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^2) + (6*A*B*d*(b*c - a*d)^2*i^3*n*PolyL
og[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^2) - (a^2*B^2*d^3*i^3*n^2*PolyL
og[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^2) + (2*a*B^2*d^2*(3*b*c - 2*a*
d)*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^2) - (2*B^2*d*(
b*c - a*d)^2*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^2) -
(B^2*c^2*d*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) + (2*B^
2*c*d*(3*b*c - 2*a*d)*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g
^2) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*n*Log[e*((a + b*x)/(c + d*x))^n]*Po
lyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^2) + (6*B^2*d*(b*c - a*d)^2
*i^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
```

```
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(183c+183dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx = \int \left(\frac{6128487d^2(3bc-2ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128487d^3x}{}\right.$$

$$= \frac{\left(6128487d^3\right)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{b^2g^2} + \frac{\left(6128487d^2(3bc-\right.}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128487d^3x^2\left(\right.}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128487d^3x^2\left(\right.}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128487d^3x^2\left(\right.}{}$$

$$= \frac{6128487d^2(3bc-2ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^2} + \frac{6128487d^3x^2\left(\right.}{}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B(bc-ad)^3n\left(A+B\log\left(e\right.\right.}{b^4g^2(a+bx)}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{6128487B^2d^2(bc-ad)n(a+bx)\log\left(\right.}{b^4g^2}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{6128487B^2d^2(bc-ad)n(a+bx)\log\left(\right.}{b^4g^2}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B^2(bc-ad)^3n^2}{b^4g^2(a+bx)} - \frac{1225697}{}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B^2(bc-ad)^3n^2}{b^4g^2(a+bx)} - \frac{1225697}{}$$

$$= -\frac{6128487ABd^2(bc-ad)nx}{b^3g^2} - \frac{12256974B^2(bc-ad)^3n^2}{b^4g^2(a+bx)} - \frac{1225697}{}$$

Mathematica [B] time = 14.4706, size = 4942, normalized size = 6.69

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^2,x]
```

```
[Out] (d^2*(3*b*c - 2*a*d)*i^3*x*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(
a + b*x)/(c + d*x)]))^2)/(b^3*g^2) + (d^3*i^3*x^2*(A + B*(Log[e*((a + b*x)/
(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))^2)/(2*b^2*g^2) + (3*d*(b*c - a
*d)^2*i^3*Log[a + b*x]*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a +
b*x)/(c + d*x)]))^2)/(b^4*g^2) + (-(A^2*b^3*c^3*i^3) + 3*a*A^2*b^2*c^2*d*i^
3 - 3*a^2*A^2*b*c*d^2*i^3 + a^3*A^2*d^3*i^3 - 2*A*b^3*B*c^3*i^3*(Log[e*((a
+ b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + 6*a*A*b^2*B*c^2*d*i^3*
(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - 6*a^2*A*b*B
*c*d^2*i^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) +
2*a^3*A*B*d^3*i^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*
x)]) - b^3*B^2*c^3*i^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c
 + d*x)])^2 + 3*a*b^2*B^2*c^2*d*i^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log
[(a + b*x)/(c + d*x)])^2 - 3*a^2*b*B^2*c*d^2*i^3*(Log[e*((a + b*x)/(c + d*x
))^n] - n*Log[(a + b*x)/(c + d*x)])^2 + a^3*B^2*d^3*i^3*(Log[e*((a + b*x)/(
c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/(b^4*g^2*(a + b*x)) + (2*B*c^
3*i^3*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]
))*(-(((a/b + x)*(Log[a/b + x] + Log[a/b + x]^2))/((a + b*x)^2*Log[a/b + x]
)) - ((b*(c/d + x)*Log[c/d + x])/((-a + (b*c)/d)^2*(1 - (b*(c/d + x))/(-a +
 (b*c)/d))) + Log[1 - (b*(c/d + x))/(-a + (b*c)/d)]/(-a + (b*c)/d))/b - (-L
og[a/b + x] + Log[c/d + x] + Log[a/(c + d*x) + (b*x)/(c + d*x)])/(b*(a + b*
x))))/g^2 + (2*B*d^3*i^3*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(
a + b*x)/(c + d*x)]))*((-2*a*(a/b + x)*(-1 + Log[a/b + x]))/b^3 + (3*a^2*Lo
g[a/b + x]^2)/(2*b^4) + (a^3*(1 + Log[a/b + x]))/(b^4*(a + b*x)) + (2*a*(c/
d + x)*(-1 + Log[c/d + x]))/b^3 + ((a*x)/(2*b) - x^2/4 + (x^2*Log[a/b + x])
/2 - (a^2*Log[a + b*x])/(2*b^2))/b^2 - ((c*x)/(2*d) - x^2/4 + (x^2*Log[c/d
+ x])/2 - (c^2*Log[c + d*x])/(2*d^2))/b^2 + (a^3*(-(Log[c/d + x]/(b*(a + b*
x))) + (d*(Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b))/b^3 +
((-4*a*b*x + b^2*x^2 + (2*a^3)/(a + b*x) + 6*a^2*Log[a + b*x])*(-Log[a/b +
x] + Log[c/d + x] + Log[a/(c + d*x) + (b*x)/(c + d*x)]))/(2*b^4) - (3*a^2*(
(Log[c/d + x]*Log[(a + b*x)/(a - (b*c)/d)])/b + PolyLog[2, (b*d*(c/d + x))/
(b*c - a*d)]/b))/b^3))/g^2 + (6*B*c*d^2*i^3*n*(A + B*(Log[e*((a + b*x)/(c +
 d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))*(((a/b + x)*(-1 + Log[a/b + x]))/b
^2 - (a*Log[a/b + x]^2)/b^3 - (a^2*(1 + Log[a/b + x]))/(b^3*(a + b*x)) - ((
c/d + x)*(-1 + Log[c/d + x]))/b^2 - (a^2*(-(Log[c/d + x]/(b*(a + b*x))) + (
d*(Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b))/b^2 + ((b*x -
a^2/(a + b*x) - 2*a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[a/(c
+ d*x) + (b*x)/(c + d*x)]))/b^3 + (2*a*((Log[c/d + x]*Log[(a + b*x)/(a - (b
*c)/d)])/b + PolyLog[2, (b*d*(c/d + x))/(b*c - a*d)]/b))/b^2))/g^2 + (6*B*c
^2*d*i^3*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*
x)]))*(Log[a/b + x]^2/(2*b^2) + (a*(1 + Log[a/b + x]))/(b^2*(a + b*x)) + (a
*(-(Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a + b*x]/(b*c - a*d) - Log[c + d*
x]/(b*c - a*d)))/b))/b + ((a/(a + b*x) + Log[a + b*x])*(-Log[a/b + x] + Log
[c/d + x] + Log[a/(c + d*x) + (b*x)/(c + d*x)]))/b^2 - ((Log[c/d + x]*Log[(
a + b*x)/(a - (b*c)/d)])/b + PolyLog[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b))
/g^2 + (B^2*c^3*i^3*n^2*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(b
*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b*
x)/(c + d*x)] - (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 + 2*d*(a + b*x)*Log[
c + d*x] - 2*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*
d*x)] + d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
- a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[(
b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c -
 a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*(b*c
- a*d)*g^2*(a + b*x)) + (B^2*d^3*i^3*n^2*((-2*b^2*c^2*(b*c - a*d)*Log[(b*c
- a*d)/(c + d*x)])/d^2 + 2*a^2*(-(b*c) + a*d)*Log[(b*c - a*d)/(c + d*x)] -
(4*a*b*c*(-(b*c) + a*d)*Log[(b*c - a*d)/(c + d*x)])/d + (b^3*c^3*Log[(a + b
*x)/(c + d*x)]^2)/d^2 - (a*b^2*c^2*Log[(a + b*x)/(c + d*x)]^2)/d - ((b*c -
a*d)^2*(b*c + 5*a*d)*Log[(a + b*x)/(c + d*x)]^2)/d^2 + (b*c - a*d)*(a + b*x
)^2*Log[(a + b*x)/(c + d*x)]^2 + 2*a^2*b*c*Log[(a + b*x)/(c + d*x)]^3 - 2*a
^3*d*Log[(a + b*x)/(c + d*x)]^3 + (2*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)
```

```
/(c + d*x)]*(b*c - a*d + 3*a*d*Log[(a + b*x)/(c + d*x)]))/d + (2*a^3*b*(c +
 d*x)*(2 + 2*Log[(a + b*x)/(c + d*x)] + Log[(a + b*x)/(c + d*x)]^2))/(a + b
*x) - 9*a^2*b*c*(Log[(a + b*x)/(c + d*x)]*(Log[(a + b*x)/(c + d*x)] - 2*Log
[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]) +
 (4*a*b^2*c^2*(Log[(a + b*x)/(c + d*x)]*(Log[(a + b*x)/(c + d*x)] - 2*Log[(
b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]))/d
+ 5*a^3*d*(Log[(a + b*x)/(c + d*x)]*(Log[(a + b*x)/(c + d*x)] - 2*Log[(b*c
- a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]) - (b^2*
c^2*(b*c - a*d)*(Log[(a + b*x)/(c + d*x)]*(2*Log[(-(b*c) + a*d)/(d*(a + b*x
))] + Log[(a + b*x)/(c + d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))]
))/d^2 + 2*a^2*(-(b*c) + a*d)*(Log[(a + b*x)/(c + d*x)]^2*(3*Log[(-(b*c) +
a*d)/(d*(a + b*x))] + Log[(a + b*x)/(c + d*x)]) - 6*Log[(a + b*x)/(c + d*x)
]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*PolyLog[3, (b*(c + d*x))/(d*(
a + b*x))]))))/(2*b^4*(b*c - a*d)*g^2) + (B^2*c^2*d*i^3*n^2*(6*b*c - 6*a*d -
 (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b*x) + 6*a*d*Log[a/b + x] + 3*b*c
*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 - 6*b*c*Log[c/d + x] + 6*b*c*Log[a +
 b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a/b + x]*Log[a + b*x] + 6*a*d*Log[a/
b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]*Log[a + b*x] - 6*a*d*Log[c/d + x]*
Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 6*a*d
*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - (6*b*(b*c - a*d)*x*Log[(a
 + b*x)/(c + d*x)])/(a + b*x) + 6*b*c*Log[a + b*x]*Log[(a + b*x)/(c + d*x)]
 - 6*a*d*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 3*a*d*Log[(a + b*x)/(c + d
*x)]^2 + 3*b*d*x*Log[(a + b*x)/(c + d*x)]^2 - (3*b^2*x*(c + d*x)*Log[(a + b
*x)/(c + d*x)]^2)/(a + b*x) - 3*b*c*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(
a + b*x)/(c + d*x)]^2 - a*d*Log[(a + b*x)/(c + d*x)]^3 + 6*b*c*Log[(a + b*x
)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a*d*Log[(a + b*x)/(c + d*x)
]*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2*Log[(b*
c - a*d)/(b*c + b*d*x)] + 6*(b*c - a*d + a*d*Log[(a + b*x)/(c + d*x)])*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))] - 6*(b*c - a*d)*PolyLog[2, (b*(c + d*x)
)/(b*c - a*d)] + 6*b*c*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d
*(a + b*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 6*b*c*PolyLo
g[3, (b*(c + d*x))/(d*(a + b*x))]))/(b^2*(b*c - a*d)*g^2) - (B^2*c*d*i^3*n^
2*(6*a^2*b*c*d + 6*a^2*b*d^2*x + 6*a^2*b*c*d*Log[(a + b*x)/(c + d*x)] + 6*a
^2*b*d^2*x*Log[(a + b*x)/(c + d*x)] + 12*a^2*b*c*d*Log[(-(b*c) + a*d)/(d*(a
 + b*x))]*Log[(a + b*x)/(c + d*x)] + 12*a*b^2*c*d*x*Log[(-(b*c) + a*d)/(d*(
a + b*x))]*Log[(a + b*x)/(c + d*x)] + 6*a^2*b*c*d*Log[(a + b*x)/(c + d*x)]^
2 + 3*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2 + 9*a^2*b*d^2*x*Log[(a + b*x)/(c +
 d*x)]^2 - 3*b^3*c*d*x^2*Log[(a + b*x)/(c + d*x)]^2 + 3*a*b^2*d^2*x^2*Log[(
a + b*x)/(c + d*x)]^2 - 6*a^2*b*c*d*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(
a + b*x)/(c + d*x)]^2 - 6*a*b^2*c*d*x*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log
[(a + b*x)/(c + d*x)]^2 - 2*a^3*d^2*Log[(a + b*x)/(c + d*x)]^3 - 2*a^2*b*d^
2*x*Log[(a + b*x)/(c + d*x)]^3 - 6*a*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(
b*c - a*d)/(b*c + b*d*x)] - 6*a^3*d^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a
*d)/(b*c + b*d*x)] - 6*b^3*c^2*x*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(
b*c + b*d*x)] - 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c
 + b*d*x)] + 6*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*
d*x)] + 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d
*x)] + 6*(a + b*x)*(-(b^2*c^2) - a^2*d^2 + 2*a^2*d^2*Log[(a + b*x)/(c + d*x
)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + 12*a*b*c*d*(a + b*x)*(-1 + Lo
g[(a + b*x)/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 12*a^3*d^
2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*b*d^2*x*PolyLog[3, (d*(a
 + b*x))/(b*(c + d*x))] + 12*a^2*b*c*d*PolyLog[3, (b*(c + d*x))/(d*(a + b*x
))] + 12*a*b^2*c*d*x*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]))/(b^3*(b*c -
a*d)*g^2*(a + b*x))
```

Maple [F] time = 0.686, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="maxima")
```

```
[Out] -2*A*B*c^3*i^3*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)
*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - 3*A^2*(a^2/(b^4*g^2*x + a*b
^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*c*d^2*i^3 + 1/2*(2*a^3/
(b^5*g^2*x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b
^3*g^2))*A^2*d^3*i^3 + 3*A^2*c^2*d*i^3*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x
 + a)/(b^2*g^2)) - 2*A*B*c^3*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^
2*g^2*x + a*b*g^2) - A^2*c^3*i^3/(b^2*g^2*x + a*b*g^2) + 1/2*(B^2*b^3*d^3*i
^3*x^3 + 3*(2*b^3*c*d^2*i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^3
 - 2*a^2*b*d^3*i^3)*B^2*x - 2*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*
d^2*i^3 - a^3*d^3*i^3)*B^2 + 6*((b^3*c^2*d*i^3 - 2*a*b^2*c*d^2*i^3 + a^2*b*
d^3*i^3)*B^2*x + (a*b^2*c^2*d*i^3 - 2*a^2*b*c*d^2*i^3 + a^3*d^3*i^3)*B^2)*l
og(b*x + a))*log((d*x + c)^n)^2/(b^5*g^2*x + a*b^4*g^2) - integrate(-(B^2*b
^4*c^4*i^3*log(e)^2 + (B^2*b^4*d^4*i^3*log(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))
*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e)^2 + 2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 6*
(B^2*b^4*c^2*d^2*i^3*log(e)^2 + 2*A*B*b^4*c^2*d^2*i^3*log(e))*x^2 + (B^2*b^
4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2
*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log((b*x + a)^n)^2 + 2*(2*B^2*b^4*c^3*d
*i^3*log(e)^2 + 3*A*B*b^4*c^3*d*i^3*log(e))*x + 2*(B^2*b^4*c^4*i^3*log(e) +
 (B^2*b^4*d^4*i^3*log(e) + A*B*b^4*d^4*i^3)*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(
e) + A*B*b^4*c*d^3*i^3)*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d
^2*i^3)*x^2 + (4*B^2*b^4*c^3*d*i^3*log(e) + 3*A*B*b^4*c^3*d*i^3)*x)*log((b*
x + a)^n) - ((2*A*B*b^4*d^4*i^3 + (i^3*n + 2*i^3*log(e))*B^2*b^4*d^4)*x^4 +
 2*(4*A*B*b^4*c*d^3*i^3 - (a*b^3*d^4*i^3*n - (3*i^3*n + 4*i^3*log(e))*b^4*c
*d^3)*B^2)*x^3 - 2*(a*b^3*c^3*d*i^3*n - 3*a^2*b^2*c^2*d^2*i^3*n + 3*a^3*b*c
*d^3*i^3*n - a^4*d^4*i^3*n - b^4*c^4*i^3*log(e))*B^2 + (12*A*B*b^4*c^2*d^2*
i^3 + (12*a*b^3*c*d^3*i^3*n - 7*a^2*b^2*d^4*i^3*n + 12*b^4*c^2*d^2*i^3*log(
e))*B^2)*x^2 + 2*(3*A*B*b^4*c^3*d*i^3 + (3*a*b^3*c^2*d^2*i^3*n - a^3*b*d^4*
i^3*n - (i^3*n - 4*i^3*log(e))*b^4*c^3*d)*B^2)*x + 6*((b^4*c^2*d^2*i^3*n -
2*a*b^3*c*d^3*i^3*n + a^2*b^2*d^4*i^3*n)*B^2*x^2 + 2*(a*b^3*c^2*d^2*i^3*n -
 2*a^2*b^2*c*d^3*i^3*n + a^3*b*d^4*i^3*n)*B^2*x + (a^2*b^2*c^2*d^2*i^3*n -
2*a^3*b*c*d^3*i^3*n + a^4*d^4*i^3*n)*B^2)*log(b*x + a) + 2*(B^2*b^4*d^4*i^3
*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*
d*i^3*x + B^2*b^4*c^4*i^3)*log((b*x + a)^n))*log((d*x + c)^n))/(b^6*d*g^2*x
^3 + a^2*b^4*c*g^2 + (b^6*c*g^2 + 2*a*b^5*d*g^2)*x^2 + (2*a*b^5*c*g^2 + a^2
*b^4*d*g^2)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(e\left(\frac{bx+}{dx+}\right.\right.}{b^2g^2x^2 + 2\,abg^2x + a^2g^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2
*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n))
/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(bgx+ag)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^2, x)
```

3.184 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=644

$$\frac{6Bd^2i^3n(bc-ad)\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3}+\frac{2B^2d^2i^3n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^3}+\frac{6B^2d^2i^3n^2(bc$$

```
[Out] (-4*B^2*d*(b*c - a*d)*i^3*n^2*(c + d*x))/(b^3*g^3*(a + b*x)) - (B^2*(b*c -
a*d)*i^3*n^2*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) - (4*B*d*(b*c - a*d)*i^3*
n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3*(a + b*x)) - (
B*(b*c - a*d)*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*
b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2)/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2)/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d*x)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^3*(a + b*x)^2) + (2*B*d^2*(b*
c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c
 + d*x))])/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3) + (2*B^2*d^2*(b
*c - a*d)*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^3) + (6*B
*d^2*(b*c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b
*(c + d*x))/(d*(a + b*x))])/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*n^2*Poly
Log[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3)
```

Rubi [B] time = 4.81111, antiderivative size = 1512, normalized size of antiderivative = 2.35, number of steps used = 88, number of rules used = 21, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^3,x]
```

```
[Out] -(B^2*(b*c - a*d)^3*i^3*n^2)/(4*b^4*g^3*(a + b*x)^2) - (9*B^2*d*(b*c - a*d)
^2*i^3*n^2)/(2*b^4*g^3*(a + b*x)) - (9*B^2*d^2*(b*c - a*d)*i^3*n^2*Log[a +
b*x])/(2*b^4*g^3) - (3*A*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x]^2)/(b^4*g^3)
- (a*B^2*d^3*i^3*n^2*Log[a + b*x]^2)/(b^4*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3
*n^2*Log[a + b*x]^2)/(2*b^4*g^3) - (3*B^2*d^2*(b*c - a*d)*i^3*Log[-((b*c -
a*d)/(d*(a + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^3) - (3*B^2*d
^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^3)
 - (B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*g^
3*(a + b*x)^2) - (5*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(b^4*g^3*(a + b*x)) + (2*a*B*d^3*i^3*n*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(b^4*g^3) - (5*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*
x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^3) + (d^3*i^3*x*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^3) - ((b*c - a*d)^3*i^3*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/(2*b^4*g^3*(a + b*x)^2) - (3*d*(b*c - a*d)^2
*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^3*(a + b*x)) + (3*d^2
*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^
4*g^3) + (9*B^2*d^2*(b*c - a*d)*i^3*n^2*Log[c + d*x])/(2*b^4*g^3) + (2*B^2*
c*d^2*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^3) - (
```

```
5*B^2*d^2*(b*c - a*d)*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x
])/(b^4*g^3) - (2*B*c*d^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[
c + d*x])/(b^3*g^3) + (5*B*d^2*(b*c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])*Log[c + d*x])/(b^4*g^3) - (B^2*c*d^2*i^3*n^2*Log[c + d*x]^2)/(
b^3*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3*n^2*Log[c + d*x]^2)/(2*b^4*g^3) + (6*
A*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4
*g^3) + (2*a*B^2*d^3*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
b^4*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b
*c - a*d)])/(b^4*g^3) + (6*A*B*d^2*(b*c - a*d)*i^3*n*PolyLog[2, -((d*(a + b
*x))/(b*c - a*d))])/(b^4*g^3) + (2*a*B^2*d^3*i^3*n^2*PolyLog[2, -((d*(a + b
*x))/(b*c - a*d))])/(b^4*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*n^2*PolyLog[2, -
((d*(a + b*x))/(b*c - a*d))])/(b^4*g^3) + (2*B^2*c*d^2*i^3*n^2*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*n^2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*n*
Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(
b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a
+ b*x))])/(b^4*g^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(184c+184dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx = \int \left(\frac{6229504d^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} + \frac{6229504(bc-ad)^3\left(A+B\right.}{b^3g^3(a+bx\right.}$$

$$= \frac{\left(6229504d^3\right)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{b^3g^3} + \frac{\left(18688512d^2(bc-ad)\right)}{b^3}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad)^3\left(A+B\log\right.}{b^4g^3(a+bx)^2}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad)^3\left(A+B\log\right.}{b^4g^3(a+bx)^2}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad)^3\left(A+B\log\right.}{b^4g^3(a+bx)^2}$$

$$= \frac{6229504d^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^3} - \frac{3114752(bc-ad)^3\left(A+B\log\right.}{b^4g^3(a+bx)^2}$$

$$= -\frac{3114752B(bc-ad)^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^4g^3(a+bx)^2} - \frac{31147520Bd(bc-a}{b^4}$$

$$= -\frac{18688512B^2d^2(bc-ad)\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3} - \frac{3114752B(bc}{}$$

$$= -\frac{18688512B^2d^2(bc-ad)\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^3} - \frac{18688512B}{}$$

$$= -\frac{1557376B^2(bc-ad)^3n^2}{b^4g^3(a+bx)^2} - \frac{28032768B^2d(bc-ad)^2n^2}{b^4g^3(a+bx)} - \frac{28032768B^2}{}$$

$$= -\frac{1557376B^2(bc-ad)^3n^2}{b^4g^3(a+bx)^2} - \frac{28032768B^2d(bc-ad)^2n^2}{b^4g^3(a+bx)} - \frac{28032768B^2}{}$$

$$= -\frac{1557376B^2(bc-ad)^3n^2}{b^4g^3(a+bx)^2} - \frac{28032768B^2d(bc-ad)^2n^2}{b^4g^3(a+bx)} - \frac{28032768B^2}{}$$

Mathematica [B] time = 24.699, size = 6221, normalized size = 9.66

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 0.727, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{(bgx+ag)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="maxima")
```

```
[Out] -3/2*A*B*c^2*d*i^3*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a
*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g
^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^
2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^
2*d^2)*g^3)) + 1/2*A*B*c^3*i^3*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d
)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*
d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x
+ c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A^2*d^3*i^3*((6*a^2*b
*x + 5*a^3)/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6
*a*log(b*x + a)/(b^4*g^3)) + 3/2*A^2*c*d^2*i^3*((4*a*b*x + 3*a^2)/(b^5*g^3*
x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) - 3*(2*b*x +
 a)*A*B*c^2*d*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^3*x^2 + 2*a
*b^3*g^3*x + a^2*b^2*g^3) - 3/2*(2*b*x + a)*A^2*c^2*d*i^3/(b^4*g^3*x^2 + 2*
a*b^3*g^3*x + a^2*b^2*g^3) - A*B*c^3*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c)
)^n)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2*c^3*i^3/(b^3*g^3*x
^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 1/2*(2*B^2*b^3*d^3*i^3*x^3 + 4*B^2*a*b^2*
d^3*i^3*x^2 - 2*(3*b^3*c^2*d*i^3 - 6*a*b^2*c*d^2*i^3 + 2*a^2*b*d^3*i^3)*B^2
*x - (b^3*c^3*i^3 + 3*a*b^2*c^2*d*i^3 - 9*a^2*b*c*d^2*i^3 + 5*a^3*d^3*i^3)*
B^2 + 6*((b^3*c*d^2*i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 2*(a*b^2*c*d^2*i^3 - a^2
*b*d^3*i^3)*B^2*x + (a^2*b*c*d^2*i^3 - a^3*d^3*i^3)*B^2)*log(b*x + a))*log(
(d*x + c)^n)^2/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - integrate(-(4*
B^2*b^4*c^3*d*i^3*x*log(e)^2 + B^2*b^4*c^4*i^3*log(e)^2 + (B^2*b^4*d^4*i^3*
log(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e)^2 +
2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e)^2 + A*B*b^4
*c^2*d^2*i^3*log(e))*x^2 + (B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 +
 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log((
b*x + a)^n)^2 + 2*(4*B^2*b^4*c^3*d*i^3*x*log(e) + B^2*b^4*c^4*i^3*log(e) +
(B^2*b^4*d^4*i^3*log(e) + A*B*b^4*d^4*i^3)*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e
) + A*B*b^4*c*d^3*i^3)*x^3 + 3*(2*B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*
d^2*i^3)*x^2)*log((b*x + a)^n) - (2*(A*B*b^4*d^4*i^3 + (i^3*n + i^3*log(e))
*B^2*b^4*d^4)*x^4 - (9*a*b^3*c^2*d^2*i^3*n - 21*a^2*b^2*c*d^3*i^3*n + 9*a^3
*b*d^4*i^3*n + (i^3*n - 8*i^3*log(e))*b^4*c^3*d)*B^2*x + 2*(4*A*B*b^4*c*d^3
```

```
*i^3 + (3*a*b^3*d^4*i^3*n + 4*b^4*c*d^3*i^3*log(e))*B^2)*x^3 - (a*b^3*c^3*d
*i^3*n + 3*a^2*b^2*c^2*d^2*i^3*n - 9*a^3*b*c*d^3*i^3*n + 5*a^4*d^4*i^3*n -
2*b^4*c^4*i^3*log(e))*B^2 + 6*(A*B*b^4*c^2*d^2*i^3 + (2*a*b^3*c*d^3*i^3*n -
 (i^3*n - 2*i^3*log(e))*b^4*c^2*d^2)*B^2)*x^2 + 6*((b^4*c*d^3*i^3*n - a*b^3
*d^4*i^3*n)*B^2*x^3 + 3*(a*b^3*c*d^3*i^3*n - a^2*b^2*d^4*i^3*n)*B^2*x^2 + 3
*(a^2*b^2*c*d^3*i^3*n - a^3*b*d^4*i^3*n)*B^2*x + (a^3*b*c*d^3*i^3*n - a^4*d
^4*i^3*n)*B^2)*log(b*x + a) + 2*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*
x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*
log((b*x + a)^n))*log((d*x + c)^n))/(b^7*d*g^3*x^4 + a^3*b^4*c*g^3 + (b^7*c
*g^3 + 3*a*b^6*d*g^3)*x^3 + 3*(a*b^6*c*g^3 + a^2*b^5*d*g^3)*x^2 + (3*a^2*b^
5*c*g^3 + a^3*b^4*d*g^3)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right.}{b^3g^3x^3 + 3\,ab^2g^3x^2 + 3\,a^2bg^3x + a^3g^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2
*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n))
/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^3, x)
```

3.185 $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=561

$$\frac{2Bd^3i^3n\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^4}+\frac{2B^2d^3i^3n^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^4}-\frac{d^2i^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{b^3g^4(a+bx)}$$

```
[Out] (-2*B^2*d^2*i^3*n^2*(c + d*x))/(b^3*g^4*(a + b*x)) - (B^2*d*i^3*n^2*(c + d*
x)^2)/(4*b^2*g^4*(a + b*x)^2) - (2*B^2*i^3*n^2*(c + d*x)^3)/(27*b*g^4*(a +
b*x)^3) - (2*B*d^2*i^3*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(b^3*g^4*(a + b*x)) - (B*d*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(2*b^2*g^4*(a + b*x)^2) - (2*B*i^3*n*(c + d*x)^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n]))/(9*b*g^4*(a + b*x)^3) - (d^2*i^3*(c + d*x)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^4*(a + b*x)) - (d*i^3*(c + d*x)^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^4*(a + b*x)^2) - (i^3*(c
 + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b*g^4*(a + b*x)^3) -
 (d^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d
*(a + b*x))])/(b^4*g^4) + (2*B*d^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^4) + (2*B^2*d^3*i^3*n^
2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^4)
```

Rubi [B] time = 5.09333, antiderivative size = 1170, normalized size of antiderivative = 2.09, number of steps used = 100, number of rules used = 20, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{11B^2d^3n^2\log^2(a+bx)i^3}{6b^4g^4}-\frac{ABd^3n\log^2(a+bx)i^3}{b^4g^4}-\frac{B^2d^3\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)i^3}{b^4g^4}-\frac{B^2d^3\log(a+bx)\log^2\left(e\left(\frac{a+b}{c+d}\right.\right.}{b^4g^4}$$

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
)^4,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^3*i^3*n^2)/(27*b^4*g^4*(a + b*x)^3) - (17*B^2*d*(b*c -
a*d)^2*i^3*n^2)/(36*b^4*g^4*(a + b*x)^2) - (49*B^2*d^2*(b*c - a*d)*i^3*n^2)
/(18*b^4*g^4*(a + b*x)) - (49*B^2*d^3*i^3*n^2*Log[a + b*x])/(18*b^4*g^4) -
(A*B*d^3*i^3*n*Log[a + b*x]^2)/(b^4*g^4) + (11*B^2*d^3*i^3*n^2*Log[a + b*x]
^2)/(6*b^4*g^4) - (B^2*d^3*i^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*((a
+ b*x)/(c + d*x))^n]^2)/(b^4*g^4) - (B^2*d^3*i^3*Log[a + b*x]*Log[e*((a + b
*x)/(c + d*x))^n]^2)/(b^4*g^4) - (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(9*b^4*g^4*(a + b*x)^3) - (7*B*d*(b*c - a*d)^2*i^3*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^4*g^4*(a + b*x)^2) - (11*B*d^
2*(b*c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g^4*(a +
 b*x)) - (11*B*d^3*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
))/(3*b^4*g^4) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/(3*b^4*g^4*(a + b*x)^3) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2)/(2*b^4*g^4*(a + b*x)^2) - (3*d^2*(b*c - a*d)*i^3*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^4*(a + b*x)) + (d^3*i^3*Log[a + b
*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^4) + (49*B^2*d^3*i^3*n
^2*Log[c + d*x])/(18*b^4*g^4) - (11*B^2*d^3*i^3*n^2*Log[-((d*(a + b*x))/(b*
c - a*d))]*Log[c + d*x])/(3*b^4*g^4) + (11*B*d^3*i^3*n*(A + B*Log[e*((a + b
```

```
*x)/(c + d*x))^n])*Log[c + d*x])/(3*b^4*g^4) + (11*B^2*d^3*i^3*n^2*Log[c +
d*x]^2)/(6*b^4*g^4) + (2*A*B*d^3*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
- a*d)])/(b^4*g^4) - (11*B^2*d^3*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*
c - a*d)])/(3*b^4*g^4) + (2*A*B*d^3*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*c -
 a*d))])/(b^4*g^4) - (11*B^2*d^3*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c -
a*d))])/(3*b^4*g^4) - (11*B^2*d^3*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])/(3*b^4*g^4) + (2*B^2*d^3*i^3*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog
[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^4) + (2*B^2*d^3*i^3*n^2*PolyLog[
3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^4)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
```

```
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(185c+185dx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx = \int \left(\frac{6331625(bc-ad)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{b^3g^4(a+bx)^4} + \frac{18994875d(bc-ad\cdots}{b^3g\cdots}\right.$$

$$= \frac{\left(6331625d^3\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}dx}{b^3g^4} + \frac{\left(18994875d^2(bc-ad)\right)\int \frac{(A+B\cdots}{\cdots}}{b^3g^4}$$

$$= -\frac{6331625(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{18994875d(bc-ad)^2\cdots}{2b^4g^4\cdots}$$

$$= -\frac{6331625(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{18994875d(bc-ad)^2\cdots}{2b^4g^4\cdots}$$

$$= -\frac{6331625(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{18994875d(bc-ad)^2\cdots}{2b^4g^4\cdots}$$

$$= -\frac{6331625(bc-ad)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3b^4g^4(a+bx)^3} - \frac{18994875d(bc-ad)^2\cdots}{2b^4g^4\cdots}$$

$$= -\frac{12663250B(bc-ad)^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9b^4g^4(a+bx)^3} - \frac{44321375Bd(bc-\cdots}{6b\cdots}$$

$$= -\frac{6331625B^2d^3\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^4} - \frac{12663250B(bc-ad)^3n\left(\cdots\right.}{9b^4g^4(a\cdots}$$

$$= -\frac{6331625B^2d^3\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^4g^4} - \frac{6331625B^2d^3\log(a+\cdots}{b^4g\cdots}$$

$$= -\frac{12663250B^2(bc-ad)^3n^2}{27b^4g^4(a+bx)^3} - \frac{107637625B^2d(bc-ad)^2n^2}{36b^4g^4(a+bx)^2} - \frac{310249625\cdots}{18b^4\cdots}$$

$$= -\frac{12663250B^2(bc-ad)^3n^2}{27b^4g^4(a+bx)^3} - \frac{107637625B^2d(bc-ad)^2n^2}{36b^4g^4(a+bx)^2} - \frac{310249625\cdots}{18b^4\cdots}$$

$$= -\frac{12663250B^2(bc-ad)^3n^2}{27b^4g^4(a+bx)^3} - \frac{107637625B^2d(bc-ad)^2n^2}{36b^4g^4(a+bx)^2} - \frac{310249625\cdots}{18b^4\cdots}$$

Mathematica [B] time = 8.15392, size = 8775, normalized size = 15.64

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g +
 b*g*x)^4,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 0.695, size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3}{(bgx+ag)^4}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="maxima")
```

```
[Out] -1/3*A*B*c*d^2*i^3*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*
c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a
^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2
- 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a
^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3
*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d
+ 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*
d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3
)*g^4)) - 1/9*A*B*c^3*i^3*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^
2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g
^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c
^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^
5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*
d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^
2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/6*A*B*c^2*d*i^3*n*((5*a*b^2*c^2 - 22*a^2
*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^
2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*
(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*
b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*
g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2
*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c
^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) + 1/6*A^2*d^3*i^3
*((18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a
^2*b^5*g^4*x + a^3*b^4*g^4) + 6*log(b*x + a)/(b^4*g^4)) - (3*b*x + a)*A*B*c
^2*d*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*
x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 2*(3*b^2*x^2 + 3*a*b*x + a^2)*A*B*c*
d^2*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x
^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/2*(3*b*x + a)*A^2*c^2*d*i^3/(b^5*g^
4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - (3*b^2*x^2 + 3*a
*b*x + a^2)*A^2*c*d^2*i^3/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x
+ a^3*b^3*g^4) - 2/3*A*B*c^3*i^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^
4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A^2*c^3*i^
```

```
3/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/6*(18*(
b^3*c*d^2*i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 9*(b^3*c^2*d*i^3 + 2*a*b^2*c*d^2*i
^3 - 3*a^2*b*d^3*i^3)*B^2*x + (2*b^3*c^3*i^3 + 3*a*b^2*c^2*d*i^3 + 6*a^2*b*
c*d^2*i^3 - 11*a^3*d^3*i^3)*B^2 - 6*(B^2*b^3*d^3*i^3*x^3 + 3*B^2*a*b^2*d^3*
i^3*x^2 + 3*B^2*a^2*b*d^3*i^3*x + B^2*a^3*d^3*i^3)*log(b*x + a))*log((d*x +
 c)^n)^2/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) -
integrate(-1/3*(18*B^2*b^4*c^2*d^2*i^3*x^2*log(e)^2 + 12*B^2*b^4*c^3*d*i^3*
x*log(e)^2 + 3*B^2*b^4*c^4*i^3*log(e)^2 + 3*(B^2*b^4*d^4*i^3*log(e)^2 + 2*A
*B*b^4*d^4*i^3*log(e))*x^4 + 6*(2*B^2*b^4*c*d^3*i^3*log(e)^2 + A*B*b^4*c*d^
3*i^3*log(e))*x^3 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^
2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log((b*x +
 a)^n)^2 + 6*(6*B^2*b^4*c^2*d^2*i^3*x^2*log(e) + 4*B^2*b^4*c^3*d*i^3*x*log(
e) + B^2*b^4*c^4*i^3*log(e) + (B^2*b^4*d^4*i^3*log(e) + A*B*b^4*d^4*i^3)*x^
4 + (4*B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*d^3*i^3)*x^3)*log((b*x + a)^n)
+ (9*(4*a*b^3*c*d^3*i^3*n - 5*a^2*b^2*d^4*i^3*n + (i^3*n - 4*i^3*log(e))*b^
4*c^2*d^2)*B^2*x^2 - 6*(B^2*b^4*d^4*i^3*log(e) + A*B*b^4*d^4*i^3)*x^4 + 2*(
6*a*b^3*c^2*d^2*i^3*n + 12*a^2*b^2*c*d^3*i^3*n - 19*a^3*b*d^4*i^3*n + (i^3*
n - 12*i^3*log(e))*b^4*c^3*d)*B^2*x - 6*(A*B*b^4*c*d^3*i^3 + (3*a*b^3*d^4*i
^3*n - (3*i^3*n - 4*i^3*log(e))*b^4*c*d^3)*B^2)*x^3 + (2*a*b^3*c^3*d*i^3*n
+ 3*a^2*b^2*c^2*d^2*i^3*n + 6*a^3*b*c*d^3*i^3*n - 11*a^4*d^4*i^3*n - 6*b^4*
c^4*i^3*log(e))*B^2 - 6*(B^2*b^4*d^4*i^3*n*x^4 + 4*B^2*a*b^3*d^4*i^3*n*x^3
+ 6*B^2*a^2*b^2*d^4*i^3*n*x^2 + 4*B^2*a^3*b*d^4*i^3*n*x + B^2*a^4*d^4*i^3*n
)*log(b*x + a) - 6*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b
^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log((b*x + a)
^n))*log((d*x + c)^n))/(b^8*d*g^4*x^5 + a^4*b^4*c*g^4 + (b^8*c*g^4 + 4*a*b^
7*d*g^4)*x^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b^6*d*g^4)*x^3 + 2*(3*a^2*b^6*c*g^4
 + 2*a^3*b^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^4 + a^4*b^4*d*g^4)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2d^3i^3x^3 + 3\,A^2cd^2i^3x^2 + 3\,A^2c^2di^3x + A^2c^3i^3 + \left(B^2d^3i^3x^3 + 3\,B^2cd^2i^3x^2 + 3\,B^2c^2di^3x + B^2c^3i^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right.}{b^4g^4x^4 + 4\,ab^3g^4x^3 + 6\,a^2b^2g^4x^2 + 4\,a^3bg^4x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2
*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n))
/(b^4*g^4*x^4 + 4*a*b^3*g^4*x^3 + 6*a^2*b^2*g^4*x^2 + 4*a^3*b*g^4*x + a^4*g
^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix+ci)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
 algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
 a*g)^4, x)
```

3.186 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=768

$$\frac{2Bg^3n(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i}+\frac{6B^2g^3n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i}+\frac{7B^2g^3n^2(bc-$$

```
[Out] (b*B^2*(b*c - a*d)^2*g^3*n^2*x)/(3*d^3*i) + (7*B*(b*c - a*d)^2*g^3*n*(a + b
*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^3*i) - (b^2*B*(b*c - a*d)*
g^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^4*i) + (3*(b
*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i)
 - (3*b^2*(b*c - a*d)*g^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(2*d^4*i) + (b^3*g^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(3*d^4*i) + (6*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i) + ((b*c - a*d)^3*g^3*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i) +
(B^2*(b*c - a*d)^3*g^3*n^2*Log[(a + b*x)/(c + d*x)])/(3*d^4*i) - (2*B^2*(b*
c - a*d)^3*g^3*n^2*Log[c + d*x])/(d^4*i) - (7*B*(b*c - a*d)^3*g^3*n*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*d^
4*i) + (6*B^2*(b*c - a*d)^3*g^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]
)/(d^4*i) + (2*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i) + (7*B^2*(b*c - a*d)^3*g^
3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(3*d^4*i) - (2*B^2*(b*c - a*
d)^3*g^3*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i)
```

Rubi [B] time = 5.58543, antiderivative size = 1952, normalized size of antiderivative = 2.54, number of steps used = 101, number of rules used = 28, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.622, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 43, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
),x]
```

```
[Out] (5*A*b*B*(b*c - a*d)^2*g^3*n*x)/(3*d^3*i) + (b*B^2*(b*c - a*d)^2*g^3*n^2*x)
/(3*d^3*i) - (a*B^2*(b*c - a*d)^2*g^3*n^2*Log[a + b*x]^2)/(d^3*i) + (5*B^2*
(b*c - a*d)^2*g^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(3*d^3*i) - (
B*(b*c - a*d)*g^3*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*
d^2*i) + (2*a*B*(b*c - a*d)^2*g^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(d^3*i) + (b*(b*c - a*d)^2*g^3*x*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(d^3*i) - ((b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2)/(2*d^2*i) + (g^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2)/(3*d*i) - (2*B^2*(b*c - a*d)^3*g^3*n^2*Log[c + d*x])/(d^4*i
) + (2*b*B^2*c*(b*c - a*d)^2*g^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
c + d*x])/(d^4*i) + (5*B^2*(b*c - a*d)^3*g^3*n^2*Log[-((d*(a + b*x))/(b*c -
 a*d))]*Log[c + d*x])/(3*d^4*i) - (2*b*B*c*(b*c - a*d)^2*g^3*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^4*i) - (5*B*(b*c - a*d)^3*g^3*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*d^4*i) - (b*B^2*c*
(b*c - a*d)^2*g^3*n^2*Log[c + d*x]^2)/(d^4*i) - (5*B^2*(b*c - a*d)^3*g^3*n^
2*Log[c + d*x]^2)/(6*d^4*i) + (2*a*B^2*(b*c - a*d)^2*g^3*n^2*Log[a + b*x]*L
```

```
og[(b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (B^2*(b*c - a*d)^3*g^3*Log[(a + b*
x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i) + (B^2*(b*c - a*d)^3*g^3*Lo
g[(a + b*x)^n]^2*Log[i*(c + d*x)])/(d^4*i) - (A*B*(b*c - a*d)^3*g^3*n*Log[i
*(c + d*x)]^2)/(d^4*i) + (B^2*(b*c - a*d)^3*g^3*n^2*Log[a + b*x]*Log[i*(c +
 d*x)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*n^2*Log[-((d*(a + b*x))/(b*c - a
*d))]*Log[i*(c + d*x)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*n^2*Log[i*(c + d
*x)]^3)/(3*d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*n*Log[a + b*x]*Log[i*(c + d*x)
]*Log[(c + d*x)^(-n)])/(d^4*i) + (B^2*(b*c - a*d)^3*g^3*Log[a + b*x]*Log[(c
 + d*x)^(-n)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[(c + d*x)^(-n)]^2)/(d^4*i) + (2*A*B*(b*c - a*d)^3*g^3*n*Log[-(
(d*(a + b*x))/(b*c - a*d))]*Log[c*i + d*i*x])/(d^4*i) - ((b*c - a*d)^3*g^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c*i + d*i*x])/(d^4*i) - (2*B^2
*(b*c - a*d)^3*g^3*n*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[(a + b*x)^n] -
Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*Log[c*i + d*i*x])/(d^
4*i) + (B^2*(b*c - a*d)^3*g^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i
 + d*i*x]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*n*Log[e*((a + b*x)/(c + d*x))
^n]*Log[c*i + d*i*x]^2)/(d^4*i) + (2*a*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[2,
 -((d*(a + b*x))/(b*c - a*d))])/(d^3*i) - (2*B^2*(b*c - a*d)^3*g^3*n*Log[(a
 + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i) + (2*A*B*(b*c
- a*d)^3*g^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i) + (2*b*B^2*c*
(b*c - a*d)^2*g^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i) + (5*B
^2*(b*c - a*d)^3*g^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*d^4*i) +
 (2*B^2*(b*c - a*d)^3*g^3*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*n*(Log[(a + b*x)^n] - Log[e*
((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*n^2*PolyLog[3, -((d*(a + b*x
))/(b*c - a*d))])/(d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*n^2*PolyLog[3, (b*(c +
 d*x))/(b*c - a*d)])/(d^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
```

```
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186c+186dx}\,dx=\int\left(\frac{b(bc-ad)^2g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3}+\frac{(-bc+ad)^3g^3\left(A+B\log\right.}{d^3(186c+186}\right.$$

$$=\frac{(bg)\int(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx}{186d}-\frac{\left(b(bc-ad)g^2\right)\int(ag+}{}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\right.}{372d^2}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\right.}{372d^2}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\right.}{372d^2}$$

$$=\frac{b(bc-ad)^2g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{186d^3}-\frac{(bc-ad)g^3(a+bx)^2\left(A+B\right.}{372d^2}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}-\frac{B(bc-ad)g^3n(a+bx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{558d^2}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{5B^2(bc-ad)^2g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{558d^3}-\frac{B(b}{}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{5B^2(bc-ad)^2g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{558d^3}-\frac{B(b}{}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{bB^2(bc-ad)^2g^3n^2x}{558d^3}+\frac{5B^2(bc-ad)^2g^3n(a+bx}{558d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{bB^2(bc-ad)^2g^3n^2x}{558d^3}-\frac{aB^2(bc-ad)^2g^3n^2\log^2(a}{186d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{bB^2(bc-ad)^2g^3n^2x}{558d^3}-\frac{aB^2(bc-ad)^2g^3n^2\log^2(a}{186d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{bB^2(bc-ad)^2g^3n^2x}{558d^3}-\frac{aB^2(bc-ad)^2g^3n^2\log^2(a}{186d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{bB^2(bc-ad)^2g^3n^2x}{558d^3}-\frac{aB^2(bc-ad)^2g^3n^2\log^2(a}{186d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{bB^2(bc-ad)^2g^3n^2x}{558d^3}-\frac{aB^2(bc-ad)^2g^3n^2\log^2(a}{186d^3}$$

$$=\frac{5AbB(bc-ad)^2g^3nx}{558d^3}+\frac{bB^2(bc-ad)^2g^3n^2x}{558d^3}-\frac{aB^2(bc-ad)^2g^3n^2\log^2(a}{186d^3}$$

Mathematica [B] time = 4.22203, size = 3265, normalized size = 4.25

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x),x]
```

```
[Out] (g^3*(6*b*d*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*x*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - 3*b^2*d^2*(b*c - 3*a*d)*x^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 2
*b^3*d^3*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c +
 d*x)])^2 - 6*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + 18*a*B*d*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*b^2*c^2 + 2*a*b*c*d - b^2
*c*d*x + a*b*d^2*x + 2*b^2*c^2*Log[c/d + x] - b^2*c^2*Log[c/d + x]^2 - a^2*
d^2*Log[a + b*x] - 2*b^2*c*d*x*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(
a + b*x)/(c + d*x)] + b^2*c^2*Log[c + d*x] + 2*b^2*c^2*Log[c/d + x]*Log[c +
 d*x] + 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[c + d*x] - 2*b*c*Log[a/b + x
]*(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*b^2*c^2
*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*n*(-A - B*Log[e*((a + b*x)
/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(6*b^3*c^3 - 6*a*b^2*c^2*d +
 5*b^3*c^2*d*x - 3*a*b^2*c*d^2*x - 2*a^2*b*d^3*x - b^3*c*d^2*x^2 + a*b^2*d^
3*x^2 - 6*b^3*c^3*Log[c/d + x] + 3*b^3*c^3*Log[c/d + x]^2 + 3*a^2*b*c*d^2*L
og[a + b*x] + 2*a^3*d^3*Log[a + b*x] + 6*b^3*c^2*d*x*Log[(a + b*x)/(c + d*x
)] - 3*b^3*c*d^2*x^2*Log[(a + b*x)/(c + d*x)] + 2*b^3*d^3*x^3*Log[(a + b*x)
/(c + d*x)] - 5*b^3*c^3*Log[c + d*x] - 6*b^3*c^3*Log[c/d + x]*Log[c + d*x]
 - 6*b^3*c^3*Log[(a + b*x)/(c + d*x)]*Log[c + d*x] + 6*b^2*c^2*Log[a/b + x]*
(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) - 6*b^3*c^3*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 6*a^3*B*d^3*n*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[c/d + x]^2 + 2*(Lo
g[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*Log[c + d*x] - 2*(Log
[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c)
 + a*d)])) - 18*a^2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*
(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x]
 - Log[(a + b*x)/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
+ 18*a^2*B^2*d^2*n^2*(d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + b*c*Log[(a +
 b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)
/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)]) + 2*b*c*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b
*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + 9*a*B^2*d*n^2*(2
*d*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)] - 2*a^2*d^2*Log[a + b*
x]*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^2 - 2*b*
c*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log[c + d*x] - 2
*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*b^2*c^
2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + a^2*d^2*(Log[
a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (
d*(a + b*x))/(-(b*c) + a*d)]) + b^2*c^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*
Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(b*c - a*d)*(Log[(b*c - a*d)/(b
*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*
x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)]) - 4*b^2*c^2*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) - 6*a^3*B^2*d^3*n^2*(L
og[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(a + b*x)/
```

```
(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog[3, (d*(a + b
*x))/(b*(c + d*x))]) + B^2*n^2*(2*b^3*c^2*d*x - 4*a*b^2*c*d^2*x + 2*a^2*b*d
^3*x + 2*a^2*b*c*d^2*Log[a + b*x] - 2*a^3*d^3*Log[a + b*x] - 3*a^2*b*c*d^2*
Log[a + b*x]^2 - 2*a^3*d^3*Log[a + b*x]^2 + 10*a*b^2*c^2*d*Log[(a + b*x)/(c
 + d*x)] - 6*a^2*b*c*d^2*Log[(a + b*x)/(c + d*x)] - 4*a^3*d^3*Log[(a + b*x)
/(c + d*x)] + 10*b^3*c^2*d*x*Log[(a + b*x)/(c + d*x)] - 6*a*b^2*c*d^2*x*Log
[(a + b*x)/(c + d*x)] - 4*a^2*b*d^3*x*Log[(a + b*x)/(c + d*x)] - 2*b^3*c*d^
2*x^2*Log[(a + b*x)/(c + d*x)] + 2*a*b^2*d^3*x^2*Log[(a + b*x)/(c + d*x)] +
 6*a^2*b*c*d^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 4*a^3*d^3*Log[a + b*
x]*Log[(a + b*x)/(c + d*x)] + 6*a*b^2*c^2*d*Log[(a + b*x)/(c + d*x)]^2 + 6*
b^3*c^2*d*x*Log[(a + b*x)/(c + d*x)]^2 - 3*b^3*c*d^2*x^2*Log[(a + b*x)/(c +
 d*x)]^2 + 2*b^3*d^3*x^3*Log[(a + b*x)/(c + d*x)]^2 - 12*b^3*c^3*Log[c + d*
x] + 18*a*b^2*c^2*d*Log[c + d*x] - 2*a^2*b*c*d^2*Log[c + d*x] - 4*a^3*d^3*L
og[c + d*x] + 6*a^2*b*c*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 4
*a^3*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 22*b^3*c^3*Log[(d*(a
 + b*x))/(-(b*c) + a*d)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b^2*c^2*d*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 22*b^3*c^3
*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 12*a*b^2*c^2*d*L
og[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*b^3*c^3*Log[(a +
 b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 11*b^3*c^3*Log[(b*c - a
*d)/(b*c + b*d*x)]^2 + 6*a*b^2*c^2*d*Log[(b*c - a*d)/(b*c + b*d*x)]^2 + 2*a
^2*d^2*(3*b*c + 2*a*d)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 12*b^3*c^
3*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + 22*b^3
*c^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 12*a*b^2*c^2*d*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)] - 12*b^3*c^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]
)))/(6*d^4*i)
```

Maple [F] time = 0.676, size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^3}{dix+ci}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] 3*A^2*a^2*b*g^3*(x/(d*i) - c*log(d*x + c)/(d^2*i)) - 1/6*A^2*b^3*g^3*(6*c^3
*log(d*x + c)/(d^4*i) - (2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/(d^3*i)) + 3/2*A^
2*a*b^2*g^3*(2*c^2*log(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A^2*a^
3*g^3*log(d*i*x + c*i)/(d*i) + 1/6*(2*B^2*b^3*d^3*g^3*x^3 - 3*(b^3*c*d^2*g^
3 - 3*a*b^2*d^3*g^3)*B^2*x^2 + 6*(b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3 + 3*a^2
*b*d^3*g^3)*B^2*x - 6*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3
- a^3*d^3*g^3)*B^2*log(d*x + c))*log((d*x + c)^n)^2/(d^4*i) - integrate(-1/
```

```
3*(3*B^2*a^3*d^3*g^3*log(e)^2 + 6*A*B*a^3*d^3*g^3*log(e) + 3*(B^2*b^3*d^3*g
^3*log(e)^2 + 2*A*B*b^3*d^3*g^3*log(e))*x^3 + 9*(B^2*a*b^2*d^3*g^3*log(e)^2
 + 2*A*B*a*b^2*d^3*g^3*log(e))*x^2 + 3*(B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d
^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*log((b*x + a)^n)^2 +
9*(B^2*a^2*b*d^3*g^3*log(e)^2 + 2*A*B*a^2*b*d^3*g^3*log(e))*x + 6*(B^2*a^3*
d^3*g^3*log(e) + A*B*a^3*d^3*g^3 + (B^2*b^3*d^3*g^3*log(e) + A*B*b^3*d^3*g^
3)*x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e) + A*B*a*b^2*d^3*g^3)*x^2 + 3*(B^2*a^2*
b*d^3*g^3*log(e) + A*B*a^2*b*d^3*g^3)*x)*log((b*x + a)^n) - (6*B^2*a^3*d^3*
g^3*log(e) + 6*A*B*a^3*d^3*g^3 + 2*(3*A*B*b^3*d^3*g^3 + (g^3*n + 3*g^3*log(
e))*B^2*b^3*d^3)*x^3 - 6*(b^3*c^3*g^3*n - 3*a*b^2*c^2*d*g^3*n + 3*a^2*b*c*d
^2*g^3*n - a^3*d^3*g^3*n)*B^2*log(d*x + c) + 3*(6*A*B*a*b^2*d^3*g^3 - (b^3*
c*d^2*g^3*n - 3*(g^3*n + 2*g^3*log(e))*a*b^2*d^3)*B^2)*x^2 + 6*(3*A*B*a^2*b
*d^3*g^3 + (b^3*c^2*d*g^3*n - 3*a*b^2*c*d^2*g^3*n + 3*(g^3*n + g^3*log(e))*
a^2*b*d^3)*B^2)*x + 6*(B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^
2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*log((b*x + a)^n))*log((d*x + c)^n))/(d
^4*i*x + c*d^3*i), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(e\left(\frac{b}{d}\cdots\right.\right.}{dix + ci}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a
^3*g^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2
*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log(e*((b*x + a)/(d*x + c))^n))
/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{dix + ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x +
 c*i), x)
```

3.187 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=573

$$-\frac{2Bg^2n(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i}-\frac{4B^2g^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}-\frac{B^2g^2n^2(bc-}{}$$

```
[Out] -((B*(b*c - a*d)*g^2*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d
^2*i)) - (2*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(d^2*i) + (b^2*g^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/(2*d^3*i) - (4*B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i) - ((b*c - a*d)^2*g^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i) + (B
^2*(b*c - a*d)^2*g^2*n^2*Log[c + d*x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*n*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(
d^3*i) - (4*B^2*(b*c - a*d)^2*g^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)])/(d^3*i) - (2*B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i) - (B^2*(b*c - a*d)^2*g^
2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(d^3*i) + (2*B^2*(b*c - a*d)
^2*g^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i)
```

Rubi [B] time = 4.74552, antiderivative size = 1780, normalized size of antiderivative = 3.11, number of steps used = 82, number of rules used = 27, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
),x]
```

```
[Out] -((A*b*B*(b*c - a*d)*g^2*n*x)/(d^2*i)) + (a*B^2*(b*c - a*d)*g^2*n^2*Log[a +
 b*x]^2)/(d^2*i) - (B^2*(b*c - a*d)*g^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d
*x))^n])/(d^2*i) - (2*a*B*(b*c - a*d)*g^2*n*Log[a + b*x]*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(d^2*i) - (b*(b*c - a*d)*g^2*x*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2)/(d^2*i) + (g^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(2*d*i) + (B^2*(b*c - a*d)^2*g^2*n^2*Log[c + d*x])/(d^3*i) -
(2*b*B^2*c*(b*c - a*d)*g^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
x])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*
Log[c + d*x])/(d^3*i) + (2*b*B*c*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])*Log[c + d*x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^3*i) + (b*B^2*c*(b*c - a*d)*g^2*
n^2*Log[c + d*x]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*n^2*Log[c + d*x]^2)/(2
*d^3*i) - (2*a*B^2*(b*c - a*d)*g^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c
- a*d)])/(d^2*i) + (B^2*(b*c - a*d)^2*g^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*
x))/(b*c - a*d)])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*Log[(a + b*x)^n]^2*Log[i
*(c + d*x)])/(d^3*i) + (A*B*(b*c - a*d)^2*g^2*n*Log[i*(c + d*x)]^2)/(d^3*i)
 - (B^2*(b*c - a*d)^2*g^2*n^2*Log[a + b*x]*Log[i*(c + d*x)]^2)/(d^3*i) + (B
^2*(b*c - a*d)^2*g^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[i*(c + d*x)]
^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*n^2*Log[i*(c + d*x)]^3)/(3*d^3*i) - (2
*B^2*(b*c - a*d)^2*g^2*n*Log[a + b*x]*Log[i*(c + d*x)]*Log[(c + d*x)^(-n)])
```

```
/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d^3*
i) + (B^2*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)
^(-n)]^2)/(d^3*i) - (2*A*B*(b*c - a*d)^2*g^2*n*Log[-((d*(a + b*x))/(b*c - a
*d))]*Log[c*i + d*i*x])/(d^3*i) + ((b*c - a*d)^2*g^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2*Log[c*i + d*i*x])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*n*L
og[-((d*(a + b*x))/(b*c - a*d))]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c +
d*x))^n] + Log[(c + d*x)^(-n)])*Log[c*i + d*i*x])/(d^3*i) - (B^2*(b*c - a*d
)^2*g^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*i + d*i*x]^2)/(d^3*i) +
 (B^2*(b*c - a*d)^2*g^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c*i + d*i*x]^2
)/(d^3*i) - (2*a*B^2*(b*c - a*d)*g^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c -
a*d))])/(d^2*i) + (2*B^2*(b*c - a*d)^2*g^2*n*Log[(a + b*x)^n]*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(d^3*i) - (2*A*B*(b*c - a*d)^2*g^2*n*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (2*b*B^2*c*(b*c - a*d)*g^2*n^2*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*n^2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*n*Lo
g[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) + (2*B^2*(
b*c - a*d)^2*g^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log
[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (2*B^2*(
b*c - a*d)^2*g^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i) - (2
*B^2*(b*c - a*d)^2*g^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
```

```
[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187c+187dx}\,dx = \int\left(-\frac{b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2} + \frac{(bc-ad)^2g^2\left(A+B\log\left(\right.\right.}{d^2(187c+187d}\right.$$

$$= \frac{(bg)\int(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{187d} - \frac{\left(b(bc-ad)g^2\right)\int\left(A+\right.}{187}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2} + \frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\right.\right.\right.}{374d}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2} + \frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\right.\right.\right.}{374d}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2} + \frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\right.\right.\right.}{374d}$$

$$= -\frac{b(bc-ad)g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{187d^2} + \frac{g^2(a+bx)^2\left(A+B\log\left(e\left(\right.\right.\right.}{374d}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} - \frac{2aB(bc-ad)g^2n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{187d^2}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} - \frac{B^2(bc-ad)g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{187d^2} - \frac{2aB(bc}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} - \frac{B^2(bc-ad)g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{187d^2} - \frac{2aB(bc}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} - \frac{B^2(bc-ad)g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{187d^2} - \frac{2aB(bc}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} + \frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2} - \frac{B^2(bc-ad)g^2n}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} + \frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2} - \frac{B^2(bc-ad)g^2n}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} + \frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2} - \frac{B^2(bc-ad)g^2n}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} + \frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2} - \frac{B^2(bc-ad)g^2n}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} + \frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2} - \frac{B^2(bc-ad)g^2n}{}$$

$$= -\frac{AbB(bc-ad)g^2nx}{187d^2} + \frac{aB^2(bc-ad)g^2n^2\log^2(a+bx)}{187d^2} - \frac{B^2(bc-ad)g^2n}{}$$

Mathematica [B] time = 1.59149, size = 1741, normalized size = 3.04

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x),x]
```

```
[Out] (g^2*(-2*b*d*(b*c - 2*a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Lo
g[(a + b*x)/(c + d*x)])^2 + b^2*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 2*(b*c - a*d)^2*(A + B*Log[e*((a + b
*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + 2*B*n*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*b^2
*c^2 + 2*a*b*c*d - b^2*c*d*x + a*b*d^2*x + 2*b^2*c^2*Log[c/d + x] - b^2*c^2
*Log[c/d + x]^2 - a^2*d^2*Log[a + b*x] - 2*b^2*c*d*x*Log[(a + b*x)/(c + d*x
)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)] + b^2*c^2*Log[c + d*x] + 2*b^2*c^
2*Log[c/d + x]*Log[c + d*x] + 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[c + d*
x] - 2*b*c*Log[a/b + x]*(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*
c - a*d)]) + 2*b^2*c^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*a^2*B*
d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])
*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)
])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[
2, (d*(a + b*x))/(-(b*c) + a*d)])) - 4*a*B*d*n*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*d*(a + b*x)*(-1 + Log[a/b + x
]) + 2*b*(c + d*x)*(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b
+ x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*
b*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))
/(-(b*c) + a*d)])) + 4*a*B^2*d*n^2*(d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2
+ b*c*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*
d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2
*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d
*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) + B^
2*n^2*(2*d*(-(b*c) + a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)] - 2*a^2*d^2*Lo
g[a + b*x]*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^
2 - 2*b*c*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log[c +
d*x] - 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] -
2*b^2*c^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + a^2*d
^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Poly
Log[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b^2*c^2*(Log[(b*c - a*d)/(b*c + b*d
*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)])
 - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(b*c - a*d)*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)
/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)]) - 4*b^2*c^2*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x)
)/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])) - 2*a^2*B^2*d^
2*n^2*(Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(a
 + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog[3, (
d*(a + b*x))/(b*(c + d*x))])))/(2*d^3*i)
```

Maple [F] time = 0.694, size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{2}}{dix+ci}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] 2*A^2*a*b*g^2*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + 1/2*A^2*b^2*g^2*(2*c^2*l
og(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A^2*a^2*g^2*log(d*i*x + c*
i)/(d*i) + 1/2*(B^2*b^2*d^2*g^2*x^2 - 2*(b^2*c*d*g^2 - 2*a*b*d^2*g^2)*B^2*x
 + 2*(b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2*log(d*x + c))*log((d*x
 + c)^n)^2/(d^3*i) - integrate(-(B^2*a^2*d^2*g^2*log(e)^2 + 2*A*B*a^2*d^2*g
^2*log(e) + (B^2*b^2*d^2*g^2*log(e)^2 + 2*A*B*b^2*d^2*g^2*log(e))*x^2 + (B^
2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log((b*x + a)^n)
^2 + 2*(B^2*a*b*d^2*g^2*log(e)^2 + 2*A*B*a*b*d^2*g^2*log(e))*x + 2*(B^2*a^2
*d^2*g^2*log(e) + A*B*a^2*d^2*g^2 + (B^2*b^2*d^2*g^2*log(e) + A*B*b^2*d^2*g
^2)*x^2 + 2*(B^2*a*b*d^2*g^2*log(e) + A*B*a*b*d^2*g^2)*x)*log((b*x + a)^n)
- (2*B^2*a^2*d^2*g^2*log(e) + 2*A*B*a^2*d^2*g^2 + 2*(b^2*c^2*g^2*n - 2*a*b*
c*d*g^2*n + a^2*d^2*g^2*n)*B^2*log(d*x + c) + (2*A*B*b^2*d^2*g^2 + (g^2*n +
 2*g^2*log(e))*B^2*b^2*d^2)*x^2 + 2*(2*A*B*a*b*d^2*g^2 - (b^2*c*d*g^2*n - 2
*(g^2*n + g^2*log(e))*a*b*d^2)*B^2)*x + 2*(B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*
d^2*g^2*x + B^2*a^2*d^2*g^2)*log((b*x + a)^n))*log((d*x + c)^n))/(d^3*i*x +
 c*d^2*i), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABb^2g^2x^2 + 2\,A\right.}{dix + ci}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^
2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*
B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^
n))/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x +
 c*i), x)
```

3.188 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=303

$$\frac{2Bgn(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i}+\frac{2B^2gn^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}-\frac{2B^2gn^2(bc-ad}{}$$

```
[Out] (g*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d*i) + (2*B*(b*c -
a*d)*g*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x
))])/(d^2*i) + ((b*c - a*d)*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[
(b*c - a*d)/(b*(c + d*x))])/(d^2*i) + (2*B^2*(b*c - a*d)*g*n^2*PolyLog[2, (
d*(a + b*x))/(b*(c + d*x))])/(d^2*i) + (2*B*(b*c - a*d)*g*n*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i) -
(2*B^2*(b*c - a*d)*g*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i)
```

Rubi [B] time = 4.03193, antiderivative size = 1156, normalized size of antiderivative = 3.82, number of steps used = 65, number of rules used = 24, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.558, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$-\frac{B^2(bc-ad)gn^2\log^3(c+dx)}{3d^2i}-\frac{bB^2cgn^2\log^2(c+dx)}{d^2i}-\frac{AB(bc-ad)gn\log^2(c+dx)}{d^2i}+\frac{B^2(bc-ad)gn^2\log(a+bx)\log}{d^2i}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x),
x]
```

```
[Out] -((a*B^2*g*n^2*Log[a + b*x]^2)/(d*i)) + (2*a*B*g*n*Log[a + b*x]*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(d*i) + (b*g*x*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])^2)/(d*i) + (2*A*B*(b*c - a*d)*g*n*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/(d^2*i) + (2*b*B^2*c*g*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/(d^2*i) + (B^2*(b*c - a*d)*g*Log[(a + b*x)^n]^2*Log[c + d*x]
)/(d^2*i) - (2*b*B*c*g*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x
])/(d^2*i) - ((b*c - a*d)*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c
+ d*x])/(d^2*i) - (A*B*(b*c - a*d)*g*n*Log[c + d*x]^2)/(d^2*i) - (b*B^2*c*g
*n^2*Log[c + d*x]^2)/(d^2*i) + (B^2*(b*c - a*d)*g*n^2*Log[a + b*x]*Log[c +
d*x]^2)/(d^2*i) - (B^2*(b*c - a*d)*g*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c
 + d*x]^2)/(d^2*i) - (B^2*(b*c - a*d)*g*n^2*Log[c + d*x]^3)/(3*d^2*i) + (2*
a*B^2*g*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d*i) - (B^2*(b*c
- a*d)*g*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*i) + (2*B^
2*(b*c - a*d)*g*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/(d^2*i) +
(B^2*(b*c - a*d)*g*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d^2*i) - (B^2*(b*c
- a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(d^2*i) -
 (2*B^2*(b*c - a*d)*g*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log
[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/(d^2
*i) + (2*a*B^2*g*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d*i) - (2*B
^2*(b*c - a*d)*g*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))
])/(d^2*i) + (2*A*B*(b*c - a*d)*g*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/
(d^2*i) + (2*b*B^2*c*g*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i) +
 (2*B^2*(b*c - a*d)*g*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c -
 a*d)])/(d^2*i) - (2*B^2*(b*c - a*d)*g*n*(Log[(a + b*x)^n] - Log[e*((a + b*
x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d
```

```
)])/(d^2*i) + (2*B^2*(b*c - a*d)*g*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*
d))])/(d^2*i) + (2*B^2*(b*c - a*d)*g*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*
d)])/(d^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
```

```
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188c+188dx}\,dx = \int \left(\frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} + \frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d(c+dx)} \right.$$

$$= \frac{(bg)\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{188d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} d}{188d}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(}{188d^2}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(}{188d^2}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(}{188d^2}$$

$$= \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{188d} - \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(}{188d^2}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{188d}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{188d}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{188d}$$

$$= \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bgx\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{188d}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bg}{}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bg}{}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bg}{}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bg}{}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bg}{}$$

$$= -\frac{aB^2gn^2\log^2(a+bx)}{188d} + \frac{aBgn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{94d} + \frac{bg}{}$$

Mathematica [B] time = 0.667736, size = 802, normalized size = 2.65

$$-\frac{g\left(-B^2\left(d(a+bx)\log^2\left(\frac{a+bx}{c+dx}\right)+bc\log\left(\frac{bc-ad}{bc+bdx}\right)\log^2\left(\frac{a+bx}{c+dx}\right)-(bc-ad)\left(\log\left(\frac{bc-ad}{bc+bdx}\right)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-2\log\left(\frac{a+bx}{c+dx}\right)+\log\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d
*i*x),x]
```

```
[Out] -((g*(-(b*d*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
+ d*x)])^2) + (b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(
a + b*x)/(c + d*x)])^2*Log[c + d*x] + a*B*d*n*(A + B*Log[e*((a + b*x)/(c +
d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[c/d + x]^2 + 2*(Log[a/b + x]
- Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))
+ B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])
*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*(-1 + Log[c/d + x]) -
b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c +
d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c
- a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) - B^2*n^2*(d*(a + b*x)
*Log[(a + b*x)/(c + d*x)]^2 + b*c*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d
)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*
c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(Log[(a + b
*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a +
 b*x))/(b*(c + d*x))])) + a*B^2*d*n^2*(Log[(a + b*x)/(c + d*x)]^2*Log[(b*c
- a*d)/(b*c + b*d*x)] + 2*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))
/(b*(c + d*x))] - 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i))
```

Maple [F] time = 0.52, size = 0, normalized size = 0.

$$\int\frac{bgx+ag}{dix+ci}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^2bg\left(\frac{x}{di}-\frac{c\log(dx+c)}{d^2i}\right)+\frac{A^2ag\log(dix+ci)}{di}+\frac{\left(B^2bdgx-\left(bcg-adg\right)B^2\log(dx+c)\right)\log\left((dx+c)^n\right)^2}{d^2i}-\int-\frac{B^2adg\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] A^2*b*g*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + A^2*a*g*log(d*i*x + c*i)/(d*i)
 + (B^2*b*d*g*x - (b*c*g - a*d*g)*B^2*log(d*x + c))*log((d*x + c)^n)^2/(d^2
```

```
*i) - integrate(-(B^2*a*d*g*log(e)^2 + 2*A*B*a*d*g*log(e) + (B^2*b*d*g*x +
B^2*a*d*g)*log((b*x + a)^n)^2 + (B^2*b*d*g*log(e)^2 + 2*A*B*b*d*g*log(e))*x
 + 2*(B^2*a*d*g*log(e) + A*B*a*d*g + (B^2*b*d*g*log(e) + A*B*b*d*g)*x)*log(
(b*x + a)^n) - 2*(B^2*a*d*g*log(e) + A*B*a*d*g - (b*c*g*n - a*d*g*n)*B^2*lo
g(d*x + c) + ((g*n + g*log(e))*B^2*b*d + A*B*b*d*g)*x + (B^2*b*d*g*x + B^2*
a*d*g)*log((b*x + a)^n))*log((d*x + c)^n))/(d^2*i*x + c*d*i), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABbgx + ABag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] integral((A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log(e*((b*x + a)/(d*x
 + c))^n)^2 + 2*(A*B*b*g*x + A*B*a*g)*log(e*((b*x + a)/(d*x + c))^n))/(d*i*
x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{dix + ci}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c
*i), x)
```

3.189 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ci+dix}\,dx$

Optimal. Leaf size=137

$$-\frac{2Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di}+\frac{2B^2n^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{di}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{di}$$

```
[Out] -(((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])
/(d*i)) - (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a +
b*x))/(b*(c + d*x))])/(d*i) + (2*B^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d
*x))])/(d*i)
```

Rubi [B] time = 3.17201, antiderivative size = 782, normalized size of antiderivative = 5.71, number of steps used = 45, number of rules used = 23, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.657, Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

$$-\frac{2ABn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di}+\frac{2B^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)\left(-\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\log\left((a+bx)^n\right)+\log\left((c+dx)^{-n}\right)\right)}{di}-2B^2n$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x),x]
```

```
[Out] (B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d*i) - (B^2*Log[(a
 + b*x)^n]^2*Log[i*(c + d*x)])/(d*i) + (A*B*n*Log[i*(c + d*x)]^2)/(d*i) - (
B^2*n^2*Log[a + b*x]*Log[i*(c + d*x)]^2)/(d*i) + (B^2*n^2*Log[-((d*(a + b*x
))/(b*c - a*d))]*Log[i*(c + d*x)]^2)/(d*i) + (B^2*n^2*Log[i*(c + d*x)]^3)/(
3*d*i) - (2*B^2*n*Log[a + b*x]*Log[i*(c + d*x)]*Log[(c + d*x)^(-n)])/(d*i)
- (B^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d*i) + (B^2*Log[-((d*(a + b*x))
/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(d*i) - (2*A*B*n*Log[-((d*(a + b*x))/
(b*c - a*d))]*Log[c*i + d*i*x])/(d*i) + ((A + B*Log[e*((a + b*x)/(c + d*x))
^n])^2*Log[c*i + d*i*x])/(d*i) + (2*B^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]
*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*
Log[c*i + d*i*x])/(d*i) - (B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*
i + d*i*x]^2)/(d*i) + (B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c*i + d*i*x
]^2)/(d*i) + (2*B^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/(d*i) - (2*A*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*i) - (2*B^
2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*i) + (2*B
^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n
)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*i) - (2*B^2*n^2*PolyLog[3, -(
(d*(a + b*x))/(b*c - a*d))])/(d*i) - (2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b
*c - a*d)])/(d*i)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
```

```
[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{189c+189dx}dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{a+bx}}{189d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(189c+1}{(a+bx)(c+dx)}}{189d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2B(bc-ad)n)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(18}{(a+bx)(c+dx)}}{189d}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{(2B(bc-ad)n)\int \left(\frac{d\left(-A-B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log}{(bc-ad)(c+dx)}\right.}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{1}{189}(2Bn)\int \frac{\left(-A-B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\mathrm{l}}{c+dx}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{1}{189}(2Bn)\int \left(\frac{A\log(189c+189dx)}{-c-dx} + \frac{B}{-}\right.$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx)}{189d} - \frac{1}{189}(2ABn)\int \frac{\log(189c+189dx)}{-c-dx}dx -$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(189c+189dx)}{189d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx}{189d}$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(189c+189dx)}{189d} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(189c+189dx}{189d}$$

$$= -\frac{B^2\log^2((a+bx)^n)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{2B^2n\log(a+bx)\log}{}$$

$$= -\frac{B^2\log^2((a+bx)^n)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} + \frac{B^2\log^2((a+bx)^n)\mathrm{l}}{189d}$$

$$= -\frac{B^2\log^2((a+bx)^n)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\log(a+bx)\log}{189d}$$

$$= -\frac{B^2\log^2((a+bx)^n)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\log(a+bx)\log}{189d}$$

$$= -\frac{B^2\log^2((a+bx)^n)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\log(a+bx)\log}{189d}$$

$$= -\frac{B^2\log^2((a+bx)^n)\log(189(c+dx))}{189d} + \frac{ABn\log^2(189(c+dx))}{189d} - \frac{B^2n^2\log(a+bx)\log}{189d}$$

Mathematica [B] time = 0.278505, size = 306, normalized size = 2.23

$$-Bn\left(-2\left(\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2\log(c+dx)\left(-\log\left(\frac{a+bx}{c+dx}\right)+\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)\right)\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x),x]
```

```
[Out] ((A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Lo
g[c + d*x] - B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/
(c + d*x)])*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x
)/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]
 + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) - B^2*n^2*(Log[(a + b*x)/(c +
 d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(a + b*x)/(c + d*x)]*PolyLo
g[2, (d*(a + b*x))/(b*(c + d*x))] - 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x)
)]))/(d*i)
```

Maple [F] time = 0.519, size = 0, normalized size = 0.

$$\int \frac{1}{dix+ci}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{B^2\log(dx+c)\log\left((dx+c)^n\right)^2}{di}+\frac{A^2\log(dix+ci)}{di}-\int -\frac{B^2\log\left((bx+a)^n\right)^2+B^2\log(e)^2+2\,AB\log(e)+2\left(B^2\log(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="maxi
ma")
```

```
[Out] B^2*log(d*x + c)*log((d*x + c)^n)^2/(d*i) + A^2*log(d*i*x + c*i)/(d*i) - in
tegrate(-(B^2*log((b*x + a)^n)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log
(e) + A*B)*log((b*x + a)^n) - 2*(B^2*n*log(d*x + c) + B^2*log((b*x + a)^n)
+ B^2*log(e) + A*B)*log((d*x + c)^n))/(d*i*x + c*i), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2}{dix+ci},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="fric
as")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(d*i*x + c*i), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{dix+ci}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="giac
")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i), x)
```

3.190 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)}\,dx$

Optimal. Leaf size=50

$$\frac{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bgin(bc-ad)}$$

```
[Out] (A + B*Log[e*((a + b*x)/(c + d*x))^n])^3/(3*B*(b*c - a*d)*g*i*n)
```

Rubi [C] time = 5.32237, antiderivative size = 1237, normalized size of antiderivative = 24.74, number of steps used = 59, number of rules used = 29, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.644, Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$-\frac{B^2n^2\log^3(c+dx)}{3(bc-ad)gi}-\frac{ABn\log^2(c+dx)}{(bc-ad)gi}+\frac{B^2n^2\log(a+bx)\log^2(c+dx)}{(bc-ad)gi}-\frac{B^2n\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\log^2(c+dx)}{(bc-ad)gi}+\frac{B^2\log$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*i*x)),
x]
```

```
[Out] -((A*B*n*Log[a + b*x]^2)/((b*c - a*d)*g*i)) - (B^2*Log[-((b*c - a*d)/(d*(a
+ b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)*g*i) - (B^2*Log[a
+ b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)*g*i) + (Log[a + b*x]*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)*g*i) + (2*A*B*n*Log[
-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)*g*i) + (B^2*Log[(a
 + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)*g*i) - ((A + B*Log[e*((a + b*x)/(c
+ d*x))^n])^2*Log[c + d*x])/((b*c - a*d)*g*i) - (A*B*n*Log[c + d*x]^2)/((b*
c - a*d)*g*i) + (B^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)*g*i) - (
B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)*g*i) - (B
^2*n^2*Log[c + d*x]^3)/(3*(b*c - a*d)*g*i) + (2*A*B*n*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) - (B^2*Log[(a + b*x)^n]^2*Log[(b*
(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*B^2*n*Log[a + b*x]*Log[c +
d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)*g*i) + (B^2*Log[a + b*x]*Log[(c + d*
x)^(-n)]^2)/((b*c - a*d)*g*i) - (B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
(c + d*x)^(-n)]^2)/((b*c - a*d)*g*i) - (2*B^2*n*Log[-((d*(a + b*x))/(b*c -
a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Lo
g[(c + d*x)^(-n)]))/((b*c - a*d)*g*i) + (2*A*B*n*PolyLog[2, -((d*(a + b*x))
/(b*c - a*d))])/((b*c - a*d)*g*i) - (2*B^2*n*Log[(a + b*x)^n]*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)*g*i) + (2*A*B*n*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*B^2*n*Log[(c + d*x)^(-n)]*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) - (2*B^2*n*(Log[(a + b
*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*B^2*n*Log[e*((a + b*x)/(c
 + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)*g*i) +
(2*B^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)*g*i) + (2
*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*g*i) + (2*B^2*
n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)*g*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
```

```
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(190c+190dx)(ag+bgx)}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g(c+dx)}\right)dx$$

$$= \frac{b\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{190(bc-ad)g} - \frac{d\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{190(bc-ad)g}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+dx)}{190(bc-ad)g} - \frac{(Bn)\int \cdots}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+dx)}{190(bc-ad)g} - \frac{(Bn)\int \cdots}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+dx)}{190(bc-ad)g} - \frac{(Bn)\int \cdots}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+dx)}{190(bc-ad)g} - \frac{(Bn)\int \cdots}{\cdots}$$

$$= \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c+dx)}{190(bc-ad)g} - \frac{(ABn)\cdots}{\cdots}$$

$$= -\frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} + \frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc-ad)g} - \frac{\left(A+B\log \cdots\right.}{\cdots}$$

$$= -\frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} + \frac{\log(a+bx)\left(\cdots\right.}{19\cdots}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{190(bc-ad)g}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{190(bc-ad)g}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{190(bc-ad)g}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{190(bc-ad)g}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{190(bc-ad)g}$$

$$= -\frac{ABn\log^2(a+bx)}{190(bc-ad)g} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc-ad)g} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{190(bc-ad)g}$$

$$= -\frac{ABn\log^2(a+bx)}{\cdots} - \frac{B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{\cdots} - \frac{B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.}{\cdots}$$

Mathematica [A] time = 0.379888, size = 90, normalized size = 1.8

$$\frac{3A^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3AB\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B^2\log^3\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bcgin-3adgin}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*
i*x)),x]
```

```
[Out] (3*A^2*Log[e*((a + b*x)/(c + d*x))^n] + 3*A*B*Log[e*((a + b*x)/(c + d*x))^n
]^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^3)/(3*b*c*g*i*n - 3*a*d*g*i*n)
```

Maple [F] time = 0.755, size = 0, normalized size = 0.

$$\int\frac{1}{(bgx+ag)(dix+ci)}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

Maxima [B] time = 1.3074, size = 549, normalized size = 10.98

$$B^2\left(\frac{\log(bx+a)}{(bc-ad)gi}-\frac{\log(dx+c)}{(bc-ad)gi}\right)\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)^2+2\,AB\left(\frac{\log(bx+a)}{(bc-ad)gi}-\frac{\log(dx+c)}{(bc-ad)gi}\right)\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] B^2*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x + c)/((b*c - a*d)*g*i))*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n)^2 + 2*A*B*(log(b*x + a)/((b*c - a*d)*g*i)
 - log(d*x + c)/((b*c - a*d)*g*i))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
 1/3*((log(b*x + a)^3 - 3*log(b*x + a)^2*log(d*x + c) + 3*log(b*x + a)*log(
d*x + c)^2 - log(d*x + c)^3)*n^2/(b*c*g*i - a*d*g*i) - 3*(log(b*x + a)^2 -
2*log(b*x + a)*log(d*x + c) + log(d*x + c)^2)*n*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n)/(b*c*g*i - a*d*g*i))*B^2 - (log(b*x + a)^2 - 2*log(b*x + a)*log
(d*x + c) + log(d*x + c)^2)*A*B*n/(b*c*g*i - a*d*g*i) + A^2*(log(b*x + a)/(
(b*c - a*d)*g*i) - log(d*x + c)/((b*c - a*d)*g*i))
```

Fricas [B] time = 0.482501, size = 339, normalized size = 6.78

$$\frac{B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^3+3\,B^2\log(e)^2\log\left(\frac{bx+a}{dx+c}\right)+3\,ABn\log\left(\frac{bx+a}{dx+c}\right)^2+3\,A^2\log\left(\frac{bx+a}{dx+c}\right)+3\left(B^2n\log\left(\frac{bx+a}{dx+c}\right)^2+2\,AB\log\left(\frac{bx}{dx}\right.\right.}{3\,(bc-ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x, alg
orithm="fricas")
```

```
[Out] 1/3*(B^2*n^2*log((b*x + a)/(d*x + c))^3 + 3*B^2*log(e)^2*log((b*x + a)/(d*x
 + c)) + 3*A*B*n*log((b*x + a)/(d*x + c))^2 + 3*A^2*log((b*x + a)/(d*x + c)
) + 3*(B^2*n*log((b*x + a)/(d*x + c))^2 + 2*A*B*log((b*x + a)/(d*x + c)))*l
og(e))/((b*c - a*d)*g*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.34138, size = 217, normalized size = 4.34

$$-\frac{B^2 in^2 \log\left(\frac{bx+a}{dx+c}\right)^3}{3\left(bcg-adg\right)}-\frac{\left(ABin+B^2 in\right)\log\left(\frac{bx+a}{dx+c}\right)^2}{bcg-adg}-\frac{\left(A^2 i+2\,ABi+B^2 i\right)\log\left(\left|\frac{2\,bdx+bc+ad-|-bc+ad|}{2\,bdx+bc+ad+|-bc+ad|}\right|\right)}{g|-bc+ad|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] -1/3*B^2*i*n^2*log((b*x + a)/(d*x + c))^3/(b*c*g - a*d*g) - (A*B*i*n + B^2*
i*n)*log((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - (A^2*i + 2*A*B*i + B^2*i)
*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs
(-b*c + a*d))))/(g*abs(-b*c + a*d))
```

3.191 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)}\,dx$

Optimal. Leaf size=199

$$-\frac{d\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bg^2in(bc-ad)^2}-\frac{b(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i(a+bx)(bc-ad)^2}-\frac{2bBn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i(a+bx)(bc-ad)^2}-\frac{2bB^2n}{g^2i(a+b}$$

```
[Out] (-2*b*B^2*n^2*(c + d*x))/((b*c - a*d)^2*g^2*i*(a + b*x)) - (2*b*B*n*(c + d*
x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^2*i*(a + b*x))
- (b*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g^2
*i*(a + b*x)) - (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*
d)^2*g^2*i*n)
```

Rubi [C] time = 6.08801, antiderivative size = 1800, normalized size of antiderivative = 9.05, number of steps used = 83, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)
),x]
```

```
[Out] (-2*B^2*n^2)/((b*c - a*d)*g^2*i*(a + b*x)) - (2*B^2*d*n^2*Log[a + b*x])/((b
*c - a*d)^2*g^2*i) + (A*B*d*n*Log[a + b*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*
d*n^2*Log[a + b*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[-((b*c - a*d)/(d*(
a + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^2*g^2*i) + (B^2*
d*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^2*g^2*i) - (2
*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*g^2*i*(a + b*x))
- (2*B*d*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d
)^2*g^2*i) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((b*c - a*d)*g^2*i*(a
 + b*x)) - (d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c
- a*d)^2*g^2*i) + (2*B^2*d*n^2*Log[c + d*x])/((b*c - a*d)^2*g^2*i) - (2*A*B
*d*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^2*g^2*i)
- (2*B^2*d*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)
^2*g^2*i) - (B^2*d*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^2*g^2*i) +
 (2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)
^2*g^2*i) + (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c
 - a*d)^2*g^2*i) + (A*B*d*n*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*
n^2*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) - (B^2*d*n^2*Log[a + b*x]*Log[c +
 d*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*n*Log[e*((a + b*x)/(c + d*x))^n]*Lo
g[c + d*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*n^2*Log[c + d*x]^3)/(3*(b*c -
a*d)^2*g^2*i) - (2*A*B*d*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b
*c - a*d)^2*g^2*i) - (2*B^2*d*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d
)])/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*
c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*n*Log[a + b*x]*Log[c + d*x]*Log
[(c + d*x)^(-n)])/((b*c - a*d)^2*g^2*i) - (B^2*d*Log[a + b*x]*Log[(c + d*x)
^(-n)]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*
Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^2*g^2*i) + (2*B^2*d*n*Log[-((d*(a + b*x
))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x
```

```
))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^2*g^2*i) - (2*A*B*d*n*PolyLog[2,
 -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*n^2*PolyLo
g[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) + (2*B^2*d*n*Log[
(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g^2*i
) - (2*A*B*d*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i)
 - (2*B^2*d*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i
) - (2*B^2*d*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(
(b*c - a*d)^2*g^2*i) + (2*B^2*d*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c +
 d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b
*c - a*d)^2*g^2*i) - (2*B^2*d*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1
 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*n^2*PolyLog
[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*n^2*Pol
yLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*n^2*Po
lyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g^2*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
```

```
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(191c+191dx)(ag+bgx)^2}\,dx = \int\left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)^2} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2(a+bx)} + \frac{d^2\left(A+B\log\left(e\left(\cdots\right.\right.\right.}{191(bc-ad)^2g^2\cdots}\right.$$

$$= -\frac{(bd)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}dx}{191(bc-ad)^2g^2} + \frac{d^2\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}dx}{191(bc-ad)^2g^2} + \frac{b\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\cdots\right.\right.}{(a+bx)^2}}{191(bc-ad)g^2}\cdots$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d\left(A+B\,\mathrm{lo}\cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d\left(A+B\,\mathrm{lo}\cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d\left(A+B\,\mathrm{lo}\cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)g^2(a+bx)} - \frac{d\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc-ad)^2g^2} + \frac{d\left(A+B\,\mathrm{lo}\cdots\right.}{\cdots}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc-ad)g^2(a+bx)} - \frac{2Bdn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc-ad)^2g^2} - \frac{\left(A\cdots\right.}{191\cdots}$$

$$= \frac{B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc-ad)^2g^2} - \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc-ad)g^2(a+bx)} - \frac{2Bdn\log(a+b\cdots}{19\cdots}$$

$$= \frac{B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc-ad)^2g^2} + \frac{B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc-ad)^2g^2} - \frac{2Bn\left(A\cdots\right.}{191(bc\cdots}$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} + \frac{B^2d\log\left(\cdots\right.}{\cdots}$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} + \frac{B^2dn^2\log\cdots}{191(bc-\cdots}$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} + \frac{B^2dn^2\log\cdots}{191(bc-\cdots}$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} + \frac{B^2dn^2\log\cdots}{191(bc-\cdots}$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} + \frac{B^2dn^2\log\cdots}{191(bc-\cdots}$$

$$= -\frac{2B^2n^2}{191(bc-ad)g^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{191(bc-ad)^2g^2} + \frac{ABdn\log^2(a+bx)}{191(bc-ad)^2g^2} + \frac{B^2dn^2\log\cdots}{191(bc-\cdots}$$

Mathematica [B] time = 0.791503, size = 793, normalized size = 3.98

$$\frac{-2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2-2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)-\ldots}{g^2i(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i +
d*i*x)),x]
```

```
[Out] -(B^2*d*n^2*Log[(a + b*x)/(c + d*x)]^3)/(3*(b*c - a*d)^2*g^2*i) + (2*B*n*Lo
g[(a + b*x)/(c + d*x)]*(A + B*n + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log
[(a + b*x)/(c + d*x)])))/((-(b*c) + a*d)*g^2*i*(a + b*x)) + (Log[(a + b*x)/
(c + d*x)]^2*(-(a*A*B*d*n) - b*B^2*c*n^2 - A*b*B*d*n*x - b*B^2*d*n^2*x - a*
B^2*d*n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - b*B
^2*d*n*x*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])))/((
-(b*c) + a*d)^2*g^2*i*(a + b*x)) + (-A^2 - 2*A*B*n - 2*B^2*n^2 - 2*A*B*(Log
[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*B^2*n*(Log[e*
((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - B^2*(Log[e*((a + b
*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/((b*c - a*d)*g^2*i*(a +
b*x)) - (d*Log[a + b*x]*(A^2 + 2*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b*x
)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + 2*B^2*n*(Log[e*((a + b*x)/(
c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d*x
))^n] - n*Log[(a + b*x)/(c + d*x)])^2))/((b*c - a*d)^2*g^2*i) + (d*(A^2 + 2
*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x
)/(c + d*x)]) + 2*B^2*n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(
c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x
)])^2)*Log[c + d*x])/((b*c - a*d)^2*g^2*i)
```

Maple [F] time = 0.701, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2\left(dix+ci\right)}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

Maxima [B] time = 1.54812, size = 1374, normalized size = 6.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] -B^2*(1/((b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/
((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*
c*d + a^2*d^2)*g^2*i))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 - 2*A*B*(1/
```

```
((b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^
2 - 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^
2*d^2)*g^2*i))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/3*(((b*d*x + a*d)
*log(b*x + a)^3 - (b*d*x + a*d)*log(d*x + c)^3 - 3*(b*d*x + a*d)*log(b*x +
a)^2 - 3*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))*log(d*x + c)^2 + 6*b*c
- 6*a*d + 6*(b*d*x + a*d)*log(b*x + a) - 3*(2*b*d*x + (b*d*x + a*d)*log(b*x
 + a)^2 + 2*a*d - 2*(b*d*x + a*d)*log(b*x + a))*log(d*x + c))*n^2/(a*b^2*c^
2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*d^2*g^2*i + (b^3*c^2*g^2*i - 2*a*b^2*c*d*
g^2*i + a^2*b*d^2*g^2*i)*x) - 3*((b*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*
d)*log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x
 + a*d - (b*d*x + a*d)*log(b*x + a))*log(d*x + c))*n*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n)/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*d^2*g^2*i + (b^
3*c^2*g^2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*i)*x))*B^2 + ((b*d*x + a*d)
*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x +
 a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))*log(d*x +
 c))*A*B*n/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*d^2*g^2*i + (b^3*c^2*
g^2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*i)*x) - A^2*(1/((b^2*c - a*b*d)*g
^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^
2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i))
```

Fricas [B] time = 0.540508, size = 956, normalized size = 4.8

$$-\frac{3A^2bc - 3A^2ad + \left(B^2bdn^2x + B^2adn^2\right)\log\left(\frac{bx+a}{dx+c}\right)^3 + 6\left(B^2bc - B^2ad\right)n^2 + 3\left(B^2bc - B^2ad + \left(B^2bdx + B^2ad\right)\log\left(\frac{b}{d}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] -1/3*(3*A^2*b*c - 3*A^2*a*d + (B^2*b*d*n^2*x + B^2*a*d*n^2)*log((b*x + a)/(
d*x + c))^3 + 6*(B^2*b*c - B^2*a*d)*n^2 + 3*(B^2*b*c - B^2*a*d + (B^2*b*d*x
 + B^2*a*d)*log((b*x + a)/(d*x + c)))*log(e)^2 + 3*(B^2*b*c*n^2 + A*B*a*d*n
 + (B^2*b*d*n^2 + A*B*b*d*n)*x)*log((b*x + a)/(d*x + c))^2 + 6*(A*B*b*c - A
*B*a*d)*n + 3*(2*A*B*b*c - 2*A*B*a*d + (B^2*b*d*n*x + B^2*a*d*n)*log((b*x +
 a)/(d*x + c))^2 + 2*(B^2*b*c - B^2*a*d)*n + 2*(B^2*b*c*n + A*B*a*d + (B^2*
b*d*n + A*B*b*d)*x)*log((b*x + a)/(d*x + c)))*log(e) + 3*(2*B^2*b*c*n^2 + 2
*A*B*b*c*n + A^2*a*d + (2*B^2*b*d*n^2 + 2*A*B*b*d*n + A^2*b*d)*x)*log((b*x
+ a)/(d*x + c)))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*i*x + (a*b^2*c^2
- 2*a^2*b*c*d + a^3*d^2)*g^2*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(bgx+ag\right)^{2}(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^2*(d*i*x
+ c*i)), x)
```

3.192 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)}\,dx$

Optimal. Leaf size=369

$$-\frac{b^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3i(a+bx)^2(bc-ad)^3}-\frac{b^2Bn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3}+\frac{d^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bg^3in(bc-ad)^3}+\ldots 2bd($$

```
[Out] (4*b*B^2*d*n^2*(c + d*x))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B^2*n^2*(c
 + d*x)^2)/(4*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (4*b*B*d*n*(c + d*x)*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*B
*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g^3
*i*(a + b*x)^2) + (2*b*d*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
)/((b*c - a*d)^3*g^3*i*(a + b*x)) - (b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g^3*i*(a + b*x)^2) + (d^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^3*g^3*i*n)
```

Rubi [C] time = 7.19728, antiderivative size = 2025, normalized size of antiderivative = 5.49, number of steps used = 111, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)
),x]
```

```
[Out] -(B^2*n^2)/(4*(b*c - a*d)*g^3*i*(a + b*x)^2) + (7*B^2*d*n^2)/(2*(b*c - a*d)
^2*g^3*i*(a + b*x)) + (7*B^2*d^2*n^2*Log[a + b*x])/(2*(b*c - a*d)^3*g^3*i)
- (A*B*d^2*n*Log[a + b*x]^2)/((b*c - a*d)^3*g^3*i) - (3*B^2*d^2*n^2*Log[a +
 b*x]^2)/(2*(b*c - a*d)^3*g^3*i) - (B^2*d^2*Log[-((b*c - a*d)/(d*(a + b*x))
)]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^3*g^3*i) - (B^2*d^2*Log[a
 + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^3*g^3*i) - (B*n*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*g^3*i*(a + b*x)^2) + (3*
B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^3*i*(a + b*x
)) + (3*B*d^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c
- a*d)^3*g^3*i) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*(b*c - a*d)*g
^3*i*(a + b*x)^2) + (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*
d)^2*g^3*i*(a + b*x)) + (d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])^2)/((b*c - a*d)^3*g^3*i) - (7*B^2*d^2*n^2*Log[c + d*x])/(2*(b*c - a*d
)^3*g^3*i) + (2*A*B*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(
(b*c - a*d)^3*g^3*i) + (3*B^2*d^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log
[c + d*x])/((b*c - a*d)^3*g^3*i) + (B^2*d^2*Log[(a + b*x)^n]^2*Log[c + d*x]
)/((b*c - a*d)^3*g^3*i) - (3*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[c + d*x])/((b*c - a*d)^3*g^3*i) - (d^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])^2*Log[c + d*x])/((b*c - a*d)^3*g^3*i) - (A*B*d^2*n*Log[c + d*x]^2)/
((b*c - a*d)^3*g^3*i) - (3*B^2*d^2*n^2*Log[c + d*x]^2)/(2*(b*c - a*d)^3*g^3
*i) + (B^2*d^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^3*g^3*i) - (B^
2*d^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^3*g^3*i
) - (B^2*d^2*n^2*Log[c + d*x]^3)/(3*(b*c - a*d)^3*g^3*i) + (2*A*B*d^2*n*Log
[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) + (3*B^2*d^
```

```
2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) -
(B^2*d^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*
g^3*i) + (2*B^2*d^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c
- a*d)^3*g^3*i) + (B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)
^3*g^3*i) - (B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^
2)/((b*c - a*d)^3*g^3*i) - (2*B^2*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*L
og[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d
*x)^(-n)]))/((b*c - a*d)^3*g^3*i) + (2*A*B*d^2*n*PolyLog[2, -((d*(a + b*x))
/(b*c - a*d))])/((b*c - a*d)^3*g^3*i) + (3*B^2*d^2*n^2*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^3*i) - (2*B^2*d^2*n*Log[(a + b*x)^n]
*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^3*i) + (2*A*B*d
^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) + (3*B^2*
d^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) + (2*B
^2*d^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c -
 a*d)^3*g^3*i) - (2*B^2*d^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x
))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c -
 a*d)^3*g^3*i) + (2*B^2*d^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 +
 (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n^2*PolyLog
[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n^2*P
olyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n^
2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^3*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
```

```
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
```

```
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
```

```
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(192c+192dx)(ag+bgx)^3}\,dx = \int\left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)g^3(a+bx)^3} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)^2} + \frac{bd^2\left(A+B\log\left(e \ldots\right.\right.}{192(bc-ad)^3g \ldots}\right.$$

$$= \frac{\left(bd^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{192(bc-ad)^3g^3} - \frac{d^3\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{192(bc-ad)^3g^3} - \frac{(bd)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx} \ldots\right.\right.\right.}{(a+bx)^2}}{192(bc-ad)^2g \ldots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B \ldots\right.}{192(bc-a \ldots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B \ldots\right.}{192(bc-a \ldots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B \ldots\right.}{192(bc-a \ldots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc-ad)g^3(a+bx)^2} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc-ad)^2g^3(a+bx)} + \frac{d^2\log(a+bx)\left(A+B \ldots\right.}{192(bc-a \ldots}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{384(bc-ad)g^3(a+bx)^2} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{64(bc-ad)^2g^3(a+bx)} + \frac{Bd^2n\log(a+bx) \ldots}{64(b \ldots}$$

$$= -\frac{B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc-ad)^3g^3} - \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{384(bc-ad)g^3(a+bx)^2} + \frac{Bdn\left(A+B\,\mathrm{l} \ldots\right.}{64(bc-ad \ldots}$$

$$= -\frac{B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc-ad)^3g^3} - \frac{B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc-ad)^3g^3} - \frac{Bn \ldots}{384 \ldots}$$

$$= -\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2} + \frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2n^2\log(a+bx)}{384(bc-ad)^3g^3} - \frac{A \ldots}{}$$

$$= -\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2} + \frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2n^2\log(a+bx)}{384(bc-ad)^3g^3} - \frac{A \ldots}{}$$

$$= -\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2} + \frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2n^2\log(a+bx)}{384(bc-ad)^3g^3} - \frac{A \ldots}{}$$

$$= -\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2} + \frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2n^2\log(a+bx)}{384(bc-ad)^3g^3} - \frac{A \ldots}{}$$

$$= -\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2} + \frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2n^2\log(a+bx)}{384(bc-ad)^3g^3} - \frac{A \ldots}{}$$

$$= -\frac{B^2n^2}{768(bc-ad)g^3(a+bx)^2} + \frac{7B^2dn^2}{384(bc-ad)^2g^3(a+bx)} + \frac{7B^2d^2n^2\log(a+bx)}{384(bc-ad)^3g^3} - \frac{A \ldots}{}$$

Mathematica [B] time = 1.42505, size = 975, normalized size = 2.64

$$4B^2d^2n^2(a+bx)^2\log^3\left(\frac{a+bx}{c+dx}\right)+6Bn\left(2Ad^2x^2b^2+3Bd^2nx^2b^2-Bc^2nb^2+2Bcdnxb^2+4aBcdnb+4aAd^2xb+4aBd^2nxb\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i +
d*i*x)),x]
```

```
[Out] (4*B^2*d^2*n^2*(a + b*x)^2*Log[(a + b*x)/(c + d*x)]^3 + 6*B*n*Log[(a + b*x)
/(c + d*x)]^2*(2*a^2*A*d^2 - b^2*B*c^2*n + 4*a*b*B*c*d*n + 4*a*A*b*d^2*x +
2*b^2*B*c*d*n*x + 4*a*b*B*d^2*n*x + 2*A*b^2*d^2*x^2 + 3*b^2*B*d^2*n*x^2 + 2
*B*d^2*(a + b*x)^2*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*d^2*n*(a + b*x)^2*L
og[(a + b*x)/(c + d*x)]) - 6*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(2*A*
b*c - 6*a*A*d + b*B*c*n - 7*a*B*d*n - 4*A*b*d*x - 6*b*B*d*n*x + 2*B*(-3*a*d
 + b*(c - 2*d*x))*Log[e*((a + b*x)/(c + d*x))^n] + 2*B*n*(-(b*c) + 3*a*d +
2*b*d*x)*Log[(a + b*x)/(c + d*x)]) - 3*(b*c - a*d)^2*(2*A^2 + 2*A*B*n + B^2
*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a +
b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*
x)/(c + d*x))^n]*(2*A + B*n - 2*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d*(b*c -
 a*d)*(a + b*x)*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c +
d*x))^n]^2 - 2*B*n*(2*A + 3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(
a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A + 3*B*n - 2
*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^2*(a + b*x)^2*Log[a + b*x]*(2*A^2 + 6
*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A +
3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*
B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A + 3*B*n - 2*B*n*Log[(a + b*x)/(c + d*
x)])) - 6*d^2*(a + b*x)^2*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a +
b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + 3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2
*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A +
 3*B*n - 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/(12*(b*c - a*d)^3*g
^3*i*(a + b*x)^2)
```

Maple [F] time = 0.701, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(dix+ci\right)}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

Maxima [B] time = 1.96391, size = 2870, normalized size = 7.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] 1/2*B^2*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 -
 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(e*(b*x/(d*x + c) + a/(d*x +
 c))^n)^2 + A*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*
d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b
^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a
*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3
 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n) - 1/12*((3*b^2*c^2 - 48*a*b*c*d + 45*a^2*d^2 - 4*(b^2*d^2*x
^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^3 + 4*(b^2*d^2*x^2 + 2*a*b*d^2*x +
 a^2*d^2)*log(d*x + c)^3 + 18*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x
 + a)^2 + 6*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a
*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c)^2 - 42*(b^2*c*d - a*b*d^2)*x
 - 42*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 6*(7*b^2*d^2*x^2
 + 14*a*b*d^2*x + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b
*x + a)^2 - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x +
 c))*n^2/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i -
 a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3
*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i +
3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x) + 6*(b^2*c^2 - 8*a*b*c*d + 7*a^
2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2
*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*
(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a
*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)
)*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(a^2*b^3*c^3*g^3*i
 - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g
^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2
 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4
*b*d^3*g^3*i)*x))*B^2 - 1/2*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x
^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x +
 a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b
*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2
 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))*A*B*
n/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^
3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^
3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b
^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x) + 1/2*A^2*((2*b*d*x - b*c + 3*a*d)/((b
^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*
d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d
^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i)
 - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*
g^3*i))
```

Fricas [B] time = 0.580213, size = 2229, normalized size = 6.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] -1/12*(6*A^2*b^2*c^2 - 24*A^2*a*b*c*d + 18*A^2*a^2*d^2 - 4*(B^2*b^2*d^2*n^2
*x^2 + 2*B^2*a*b*d^2*n^2*x + B^2*a^2*d^2*n^2)*log((b*x + a)/(d*x + c))^3 +
3*(B^2*b^2*c^2 - 16*B^2*a*b*c*d + 15*B^2*a^2*d^2)*n^2 + 6*(B^2*b^2*c^2 - 4*
```

```
B^2*a*b*c*d + 3*B^2*a^2*d^2 - 2*(B^2*b^2*c*d - B^2*a*b*d^2)*x - 2*(B^2*b^2*
d^2*x^2 + 2*B^2*a*b*d^2*x + B^2*a^2*d^2)*log((b*x + a)/(d*x + c)))*log(e)^2
 - 6*(2*A*B*a^2*d^2*n - (B^2*b^2*c^2 - 4*B^2*a*b*c*d)*n^2 + (3*B^2*b^2*d^2*
n^2 + 2*A*B*b^2*d^2*n)*x^2 + 2*(2*A*B*a*b*d^2*n + (B^2*b^2*c*d + 2*B^2*a*b*
d^2)*n^2)*x)*log((b*x + a)/(d*x + c))^2 + 6*(A*B*b^2*c^2 - 8*A*B*a*b*c*d +
7*A*B*a^2*d^2)*n - 6*(2*A^2*b^2*c*d - 2*A^2*a*b*d^2 + 7*(B^2*b^2*c*d - B^2*
a*b*d^2)*n^2 + 6*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x + 6*(2*A*B*b^2*c^2 - 8*A*
B*a*b*c*d + 6*A*B*a^2*d^2 - 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*a*b*d^2*n*x + B^2*
a^2*d^2*n)*log((b*x + a)/(d*x + c))^2 + (B^2*b^2*c^2 - 8*B^2*a*b*c*d + 7*B^
2*a^2*d^2)*n - 2*(2*A*B*b^2*c*d - 2*A*B*a*b*d^2 + 3*(B^2*b^2*c*d - B^2*a*b*
d^2)*n)*x - 2*(2*A*B*a^2*d^2 + (3*B^2*b^2*d^2*n + 2*A*B*b^2*d^2)*x^2 - (B^2
*b^2*c^2 - 4*B^2*a*b*c*d)*n + 2*(2*A*B*a*b*d^2 + (B^2*b^2*c*d + 2*B^2*a*b*d
^2)*n)*x)*log((b*x + a)/(d*x + c)))*log(e) - 6*(2*A^2*a^2*d^2 - (B^2*b^2*c^
2 - 8*B^2*a*b*c*d)*n^2 + (7*B^2*b^2*d^2*n^2 + 6*A*B*b^2*d^2*n + 2*A^2*b^2*d
^2)*x^2 - 2*(A*B*b^2*c^2 - 4*A*B*a*b*c*d)*n + 2*(2*A^2*a*b*d^2 + (3*B^2*b^2
*c*d + 4*B^2*a*b*d^2)*n^2 + 2*(A*B*b^2*c*d + 2*A*B*a*b*d^2)*n)*x)*log((b*x
+ a)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)
*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*b*d^3)*
g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d^3)*g^3*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(bgx+ag\right)^{3}(dix+ci)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^3*(d*i*x
+ c*i)), x)
```

3.193 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)}\,dx$

Optimal. Leaf size=543

$$-\frac{b^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4i(a+bx)^3(bc-ad)^4}-\frac{2b^3Bn(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4i(a+bx)^3(bc-ad)^4}+\frac{3b^2d(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}{2g^4i(a+bx)^2(bc-ad)^4}$$

```
[Out] (-6*b*B^2*d^2*n^2*(c + d*x))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2*B^2*d
*n^2*(c + d*x)^2)/(4*(b*c - a*d)^4*g^4*i*(a + b*x)^2) - (2*b^3*B^2*n^2*(c +
 d*x)^3)/(27*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (6*b*B*d^2*n*(c + d*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^
2*B*d*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^
4*g^4*i*(a + b*x)^2) - (2*b^3*B*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(9*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (3*b*d^2*(c + d*x)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^4*i*(a + b*x)) + (3*b^2
*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^4*g
^4*i*(a + b*x)^2) - (b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/(3*(b*c - a*d)^4*g^4*i*(a + b*x)^3) - (d^3*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^3)/(3*B*(b*c - a*d)^4*g^4*i*n)
```

Rubi [C] time = 8.35375, antiderivative size = 2180, normalized size of antiderivative = 4.01, number of steps used = 143, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i + d*i*x)
),x]
```

```
[Out] (-2*B^2*n^2)/(27*(b*c - a*d)*g^4*i*(a + b*x)^3) + (19*B^2*d*n^2)/(36*(b*c -
 a*d)^2*g^4*i*(a + b*x)^2) - (85*B^2*d^2*n^2)/(18*(b*c - a*d)^3*g^4*i*(a +
b*x)) - (85*B^2*d^3*n^2*Log[a + b*x])/(18*(b*c - a*d)^4*g^4*i) + (A*B*d^3*n
*Log[a + b*x]^2)/((b*c - a*d)^4*g^4*i) + (11*B^2*d^3*n^2*Log[a + b*x]^2)/(6
*(b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*((
a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[a + b*x]*Log
[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^4*i) - (2*B*n*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)*g^4*i*(a + b*x)^3) + (5*B*d*n*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*(b*c - a*d)^2*g^4*i*(a + b*x)^2) -
(11*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3*g^4*i*
(a + b*x)) - (11*B*d^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
))/(3*(b*c - a*d)^4*g^4*i) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(3*(b
*c - a*d)*g^4*i*(a + b*x)^3) + (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)
/(2*(b*c - a*d)^2*g^4*i*(a + b*x)^2) - (d^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])^2)/((b*c - a*d)^3*g^4*i*(a + b*x)) - (d^3*Log[a + b*x]*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^4*i) + (85*B^2*d^3*n^2*Log[c
 + d*x])/(18*(b*c - a*d)^4*g^4*i) - (2*A*B*d^3*n*Log[-((d*(a + b*x))/(b*c -
 a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^4*i) - (11*B^2*d^3*n^2*Log[-((d*(a +
 b*x))/(b*c - a*d))]*Log[c + d*x])/(3*(b*c - a*d)^4*g^4*i) - (B^2*d^3*Log[(
a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^4*g^4*i) + (11*B*d^3*n*(A + B*Log[
```

```
e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*(b*c - a*d)^4*g^4*i) + (d^3*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^4*g^4*i)
+ (A*B*d^3*n*Log[c + d*x]^2)/((b*c - a*d)^4*g^4*i) + (11*B^2*d^3*n^2*Log[c
+ d*x]^2)/(6*(b*c - a*d)^4*g^4*i) - (B^2*d^3*n^2*Log[a + b*x]*Log[c + d*x]^
2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c
+ d*x]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*n^2*Log[c + d*x]^3)/(3*(b*c - a*
d)^4*g^4*i) - (2*A*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b
*c - a*d)^4*g^4*i) - (11*B^2*d^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c -
a*d)])/(3*(b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[(a + b*x)^n]^2*Log[(b*(c + d*
x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n*Log[a + b*x]*Log[c +
 d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^4*g^4*i) - (B^2*d^3*Log[a + b*x]*Lo
g[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^4*i) + (2*B^2*d^3*n*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a
+ b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^4*g^4*i) - (2*A*B
*d^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^4*i) - (1
1*B^2*d^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*(b*c - a*d)^4*g^
4*i) + (2*B^2*d^3*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d)
)])/((b*c - a*d)^4*g^4*i) - (2*A*B*d^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a*
d)])/((b*c - a*d)^4*g^4*i) - (11*B^2*d^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])/(3*(b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n*Log[(c + d*x)^(-n)]*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) + (2*B^2*d^3*n*(Log[(
a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n*Log[e*
((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c -
 a*d)^4*g^4*i) - (2*B^2*d^3*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(
(b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]
)/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a +
 b*x))])/((b*c - a*d)^4*g^4*i)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
```

```
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
```

```
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
```

```
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(193c+193dx)(ag+bgx)^4}\,dx = \int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc-ad)g^4(a+bx)^4} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc-ad)^2g^4(a+bx)^3} + \frac{bd^2\left(A+B\log\left(e\right.\right.}{193(bc-ad)^3g}\right.$$

$$= -\frac{\left(bd^3\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{193(bc-ad)^4g^4} + \frac{d^4\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{193(bc-ad)^4g^4} + \frac{\left(bd^2\right)\int \frac{\left(A+B\log\left(e\left(\right.\right.\right.}{(a+bx}}{193(bc-ad}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{193(bc-ad)^3g^4(a+}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{193(bc-ad)^3g^4(a+}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{193(bc-ad)^3g^4(a+}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc-ad)g^4(a+bx)^3} + \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc-ad)^2g^4(a+bx)^2} - \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{193(bc-ad)^3g^4(a+}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1737(bc-ad)g^4(a+bx)^3} + \frac{5Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1158(bc-ad)^2g^4(a+bx)^2} - \frac{11Bd^2n\left(A+B\right.}{579(bc-ad}$$

$$= \frac{B^2d^3\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc-ad)^4g^4} - \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1737(bc-ad)g^4(a+bx)^3} + \frac{5Bdn\left(A+B\right.}{1158(bc-a}$$

$$= \frac{B^2d^3\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc-ad)^4g^4} + \frac{B^2d^3\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc-ad)^4g^4} - \frac{2Bn\left(\right.}{1737}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2n^2}{3474(bc-ad)^3g^4(a+}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2n^2}{3474(bc-ad)^3g^4(a+}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2n^2}{3474(bc-ad)^3g^4(a+}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2n^2}{3474(bc-ad)^3g^4(a+}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2n^2}{3474(bc-ad)^3g^4(a+}$$

$$= -\frac{2B^2n^2}{5211(bc-ad)g^4(a+bx)^3} + \frac{19B^2dn^2}{6948(bc-ad)^2g^4(a+bx)^2} - \frac{85B^2d^2n^2}{3474(bc-ad)^3g^4(a+}$$

Mathematica [B] time = 1.898, size = 1295, normalized size = 2.38

$$-\frac{4\left(9A^2+6BnA+2B^2n^2+9B^2\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+9B^2n^2\log^2\left(\frac{a+bx}{c+dx}\right)-6Bn(3A+Bn)\log\left(\frac{a+bx}{c+dx}\right)+6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\left(3\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)),x]
```

```
[Out] -(36*B^2*d^3*n^2*(a + b*x)^3*Log[(a + b*x)/(c + d*x)]^3 + 18*B*n*Log[(a + b
*x)/(c + d*x)]^2*(6*a^3*A*d^3 + 2*b^3*B*c^3*n - 9*a*b^2*B*c^2*d*n + 18*a^2*
b*B*c*d^2*n + 18*a^2*A*b*d^3*x - 3*b^3*B*c^2*d*n*x + 18*a*b^2*B*c*d^2*n*x +
 18*a^2*b*B*d^3*n*x + 18*a*A*b^2*d^3*x^2 + 6*b^3*B*c*d^2*n*x^2 + 27*a*b^2*B
*d^3*n*x^2 + 6*A*b^3*d^3*x^3 + 11*b^3*B*d^3*n*x^3 + 6*B*d^3*(a + b*x)^3*Log
[e*((a + b*x)/(c + d*x))^n] - 6*B*d^3*n*(a + b*x)^3*Log[(a + b*x)/(c + d*x)
]) - 3*d*(b*c - a*d)^2*(a + b*x)*(18*A^2 + 30*A*B*n + 19*B^2*n^2 + 18*B^2*L
og[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 5*B*n)*Log[(a + b*x)/(c + d*
x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x
))^n]*(6*A + 5*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^2*(b*c - a*d)*(
a + b*x)^2*(18*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d
*x))^n]^2 - 6*B*n*(6*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[
(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n -
 6*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^3*(a + b*x)^3*Log[a + b*x]*(18*A^2
+ 66*A*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(
6*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)
]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n - 6*B*n*Log[(a + b*x
)/(c + d*x)])) + 4*(b*c - a*d)^3*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2*Log[e
*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] +
9*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(
3*A + B*n - 3*B*n*Log[(a + b*x)/(c + d*x)])) + 6*B*(b*c - a*d)*n*Log[(a + b
*x)/(c + d*x)]*(3*d*(-(b*c) + a*d)*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a +
 b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*x)/(c + d*x)]) + 6*d^2*(a + b*x)^2*(
6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*x)/(c
+ d*x)]) + 4*(b*c - a*d)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]
- 3*B*n*Log[(a + b*x)/(c + d*x)])) - 6*d^3*(a + b*x)^3*(18*A^2 + 66*A*B*n +
 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 11*B*n
)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Lo
g[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)]
))*Log[c + d*x])/(108*(b*c - a*d)^4*g^4*i*(a + b*x)^3)
```

Maple [F] time = 0.71, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}\left(dix+ci\right)}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

Maxima [B] time = 2.82677, size = 4651, normalized size = 8.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] -1/6*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
- 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*
g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)
*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3
)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i
) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^
3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d
+ 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n)^2 - 1/3*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11
*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4
*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^
3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4
*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*
c*d^2 - a^6*d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*
a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^
4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i)
)*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/108*((8*b^3*c^3 - 81*a*b^2*c^2
*d + 648*a^2*b*c*d^2 - 575*a^3*d^3 + 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*
a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^3 - 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 +
 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^3 + 510*(b^3*c*d^2 - a*b^2*d^3)*x^2
- 198*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a
)^2 - 18*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 -
 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*
log(d*x + c)^2 - 3*(19*b^3*c^2*d - 378*a*b^2*c*d^2 + 359*a^2*b*d^3)*x + 510
*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6
*(85*b^3*d^3*x^3 + 255*a*b^2*d^3*x^2 + 255*a^2*b*d^3*x + 85*a^3*d^3 + 18*(b
^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 66
*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*lo
g(d*x + c))*n^2/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*
d^2*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*
c^3*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4
*g^4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^
2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g
^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^
4*i + a^6*b*d^4*g^4*i)*x) + 6*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2
 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*
d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b
^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*
a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b
*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*
a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x
 + a^3*d^3)*log(b*x + a))*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n)/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i
- 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*
i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^
3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i -
4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i - 4*a
^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i + a^6*
b*d^4*g^4*i)*x))*B^2 - 1/18*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 -
 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^
```

```
3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2
*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*
b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d
^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^
2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x +
 a^3*d^3)*log(b*x + a))*log(d*x + c))*A*B*n/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*
c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i
 + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b
^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^
3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g
^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^
2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i + a^6*b*d^4*g^4*i)*x) - 1/6*A^2*((6*b^2*d^2
*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^
6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5
*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*
b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3
*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i) + 6*d^3*log(b*x +
a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)
*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2
- 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))
```

Fricas [B] time = 0.693763, size = 3987, normalized size = 7.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] -1/108*(36*A^2*b^3*c^3 - 162*A^2*a*b^2*c^2*d + 324*A^2*a^2*b*c*d^2 - 198*A^
2*a^3*d^3 + 36*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*x^2 + 3*B^2*a^2*b
*d^3*n^2*x + B^2*a^3*d^3*n^2)*log((b*x + a)/(d*x + c))^3 + (8*B^2*b^3*c^3 -
 81*B^2*a*b^2*c^2*d + 648*B^2*a^2*b*c*d^2 - 575*B^2*a^3*d^3)*n^2 + 6*(18*A^
2*b^3*c*d^2 - 18*A^2*a*b^2*d^3 + 85*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 6
6*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*n)*x^2 + 18*(2*B^2*b^3*c^3 - 9*B^2*a*b^2*
c^2*d + 18*B^2*a^2*b*c*d^2 - 11*B^2*a^3*d^3 + 6*(B^2*b^3*c*d^2 - B^2*a*b^2*
d^3)*x^2 - 3*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 5*B^2*a^2*b*d^3)*x + 6*(B
^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*a^3*d^3)*log
((b*x + a)/(d*x + c)))*log(e)^2 + 18*(6*A*B*a^3*d^3*n + (11*B^2*b^3*d^3*n^2
 + 6*A*B*b^3*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b
*c*d^2)*n^2 + 3*(6*A*B*a*b^2*d^3*n + (2*B^2*b^3*c*d^2 + 9*B^2*a*b^2*d^3)*n^
2)*x^2 + 3*(6*A*B*a^2*b*d^3*n - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 - 6*B^2*
a^2*b*d^3)*n^2)*x)*log((b*x + a)/(d*x + c))^2 + 6*(4*A*B*b^3*c^3 - 27*A*B*a
*b^2*c^2*d + 108*A*B*a^2*b*c*d^2 - 85*A*B*a^3*d^3)*n - 3*(18*A^2*b^3*c^2*d
- 108*A^2*a*b^2*c*d^2 + 90*A^2*a^2*b*d^3 + (19*B^2*b^3*c^2*d - 378*B^2*a*b^
2*c*d^2 + 359*B^2*a^2*b*d^3)*n^2 + 6*(5*A*B*b^3*c^2*d - 54*A*B*a*b^2*c*d^2
+ 49*A*B*a^2*b*d^3)*n)*x + 6*(12*A*B*b^3*c^3 - 54*A*B*a*b^2*c^2*d + 108*A*B
*a^2*b*c*d^2 - 66*A*B*a^3*d^3 + 6*(6*A*B*b^3*c*d^2 - 6*A*B*a*b^2*d^3 + 11*(
B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*d^3*n*x^3 + 3*B^2*a*b^2
*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + B^2*a^3*d^3*n)*log((b*x + a)/(d*x + c))^
2 + (4*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2 - 85*B^2*a^3*
d^3)*n - 3*(6*A*B*b^3*c^2*d - 36*A*B*a*b^2*c*d^2 + 30*A*B*a^2*b*d^3 + (5*B^
2*b^3*c^2*d - 54*B^2*a*b^2*c*d^2 + 49*B^2*a^2*b*d^3)*n)*x + 6*(6*A*B*a^3*d^
3 + (11*B^2*b^3*d^3*n + 6*A*B*b^3*d^3)*x^3 + 3*(6*A*B*a*b^2*d^3 + (2*B^2*b^
3*c*d^2 + 9*B^2*a*b^2*d^3)*n)*x^2 + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18
*B^2*a^2*b*c*d^2)*n + 3*(6*A*B*a^2*b*d^3 - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d
```

```
^2 - 6*B^2*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))*log(e) + 6*(18*A^2*a^
3*d^3 + (85*B^2*b^3*d^3*n^2 + 66*A*B*b^3*d^3*n + 18*A^2*b^3*d^3)*x^3 + (4*B
^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2)*n^2 + 3*(18*A^2*a*b^
2*d^3 + (22*B^2*b^3*c*d^2 + 63*B^2*a*b^2*d^3)*n^2 + 6*(2*A*B*b^3*c*d^2 + 9*
A*B*a*b^2*d^3)*n)*x^2 + 6*(2*A*B*b^3*c^3 - 9*A*B*a*b^2*c^2*d + 18*A*B*a^2*b
*c*d^2)*n + 3*(18*A^2*a^2*b*d^3 - (5*B^2*b^3*c^2*d - 54*B^2*a*b^2*c*d^2 - 3
6*B^2*a^2*b*d^3)*n^2 - 6*(A*B*b^3*c^2*d - 6*A*B*a*b^2*c*d^2 - 6*A*B*a^2*b*d
^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c
^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*i*x^3 + 3*(a*b^6*c^4 - 4*a^2*b^
5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b^2*d^4)*g^4*i*x^2 + 3*
(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4*a^5*b^2*c*d^3 + a^6*
b*d^4)*g^4*i*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*b^2*c^2*d^2 - 4*a^6
*b*c*d^3 + a^7*d^4)*g^4*i)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(bgx+ag\right)^{4}\left(dix+ci\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^4*(d*i*x
+ c*i)), x)
```

3.194 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=770

$$-\frac{6bBg^3n(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i^2}-\frac{6bB^2g^3n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^2}-\frac{bB^2g^3n^2(b}{}$$

```
[Out] (2*A*B*(b*c - a*d)^2*g^3*n*(a + b*x))/(d^3*i^2*(c + d*x)) - (2*B^2*(b*c - a
*d)^2*g^3*n^2*(a + b*x))/(d^3*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)^2*g^3*n*(
a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i^2*(c + d*x)) - (b*B*(b*c -
a*d)*g^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^2) - (3
*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3
*i^2) - ((b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/(d^3*i^2*(c + d*x)) + (b^3*g^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(2*d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^2) - (3*b*(b*c -
a*d)^2*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c +
 d*x))])/(d^4*i^2) + (b*B^2*(b*c - a*d)^2*g^3*n^2*Log[c + d*x])/(d^4*i^2) +
 (b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b
*(c + d*x))/(d*(a + b*x))])/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*n^2*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*
x))])/(d^4*i^2) - (b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[2, (b*(c + d*x))/(d*
(a + b*x))])/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[3, (d*(a +
b*x))/(b*(c + d*x))])/(d^4*i^2)
```

Rubi [B] time = 6.01486, antiderivative size = 2384, normalized size of antiderivative = 3.1, number of steps used = 112, number of rules used = 28, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.622, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^2,x]
```

```
[Out] -((A*b^2*B*(b*c - a*d)*g^3*n*x)/(d^3*i^2)) + (2*B^2*(b*c - a*d)^3*g^3*n^2)/
(d^4*i^2*(c + d*x)) + (2*b*B^2*(b*c - a*d)^2*g^3*n^2*Log[a + b*x])/(d^4*i^2
) + (a^2*b*B^2*g^3*n^2*Log[a + b*x]^2)/(2*d^2*i^2) + (a*b*B^2*(2*b*c - 3*a*
d)*g^3*n^2*Log[a + b*x]^2)/(d^3*i^2) + (b*B^2*(b*c - a*d)^2*g^3*n^2*Log[a +
 b*x]^2)/(d^4*i^2) - (b*B^2*(b*c - a*d)*g^3*n*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n])/(d^3*i^2) - (2*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(d^4*i^2*(c + d*x)) - (a^2*b*B*g^3*n*Log[a + b*x]*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2) - (2*a*b*B*(2*b*c - 3*a*d)*g^3*n*Lo
g[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^2) - (2*b*B*(b*c
- a*d)^2*g^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^4*i^
2) - (b^2*(2*b*c - 3*a*d)*g^3*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(
d^3*i^2) + (b^3*g^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^2*i^
2) + ((b*c - a*d)^3*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^4*i^2*
(c + d*x)) - (b*B^2*(b*c - a*d)^2*g^3*n^2*Log[c + d*x])/(d^4*i^2) - (6*A*b*
B*(b*c - a*d)^2*g^3*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*
```

```
i^2) - (b^3*B^2*c^2*g^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])
/(d^4*i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3*n^2*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/(d^4*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*n^2*Log[-((d*
(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*g
^3*Log[(a + b*x)^n]^2*Log[c + d*x])/(d^4*i^2) + (b^3*B*c^2*g^3*n*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^4*i^2) + (2*b^2*B*c*(2*b*c -
3*a*d)*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^4*i^2)
 + (2*b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c
+ d*x])/(d^4*i^2) + (3*b*(b*c - a*d)^2*g^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2*Log[c + d*x])/(d^4*i^2) + (3*A*b*B*(b*c - a*d)^2*g^3*n*Log[c + d*x
]^2)/(d^4*i^2) + (b^3*B^2*c^2*g^3*n^2*Log[c + d*x]^2)/(2*d^4*i^2) + (b^2*B^
2*c*(2*b*c - 3*a*d)*g^3*n^2*Log[c + d*x]^2)/(d^4*i^2) + (b*B^2*(b*c - a*d)^
2*g^3*n^2*Log[c + d*x]^2)/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*g^3*n^2*Log[a
+ b*x]*Log[c + d*x]^2)/(d^4*i^2) + (3*b*B^2*(b*c - a*d)^2*g^3*n*Log[e*((a +
 b*x)/(c + d*x))^n]*Log[c + d*x]^2)/(d^4*i^2) + (b*B^2*(b*c - a*d)^2*g^3*n^
2*Log[c + d*x]^3)/(d^4*i^2) - (a^2*b*B^2*g^3*n^2*Log[a + b*x]*Log[(b*(c + d
*x))/(b*c - a*d)])/(d^2*i^2) - (2*a*b*B^2*(2*b*c - 3*a*d)*g^3*n^2*Log[a + b
*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*
n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) + (3*b*B^2*(b*c
- a*d)^2*g^3*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) -
 (6*b*B^2*(b*c - a*d)^2*g^3*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)]
)/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]*Log[(c + d*x)^(-n)]^2
)/(d^4*i^2) + (3*b*B^2*(b*c - a*d)^2*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*
Log[(c + d*x)^(-n)]^2)/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*n*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c
 + d*x))^n] + Log[(c + d*x)^(-n)]))/(d^4*i^2) - (a^2*b*B^2*g^3*n^2*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i^2) - (2*a*b*B^2*(2*b*c - 3*a*d)*g^
3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) - (2*b*B^2*(b*c -
 a*d)^2*g^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^2) + (6*b*
B^2*(b*c - a*d)^2*g^3*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c -
a*d))])/(d^4*i^2) - (6*A*b*B*(b*c - a*d)^2*g^3*n*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)])/(d^4*i^2) - (b^3*B^2*c^2*g^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/(d^4*i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3*n^2*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/(d^4*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*n*Log[
(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) + (6*b*B^2
*(b*c - a*d)^2*g^3*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + L
og[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) - (6*b
*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i
^2) - (6*b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])
/(d^4*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
```

```
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(194c+194dx)^2}\,dx = \int\left(-\frac{b^2(2bc-3ad)g^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3}+\frac{b^3g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.\right.}{37636d^2}\cdots\right.$$

$$=\frac{\left(b^3g^3\right)\int x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx}{37636d^2}-\frac{\left(b^2(2bc-3ad)g^3\right)\int\left(A+B\log\left(\cdots\right.\right.}{37636d^3}\cdots$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3}+\frac{b^3g^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.\right.}{75272d^2}\cdots$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3}+\frac{b^3g^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.\right.}{75272d^2}\cdots$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3}+\frac{b^3g^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.\right.}{75272d^2}\cdots$$

$$=-\frac{b^2(2bc-3ad)g^3x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{37636d^3}+\frac{b^3g^3x^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.\right.}{75272d^2}\cdots$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}-\frac{B(bc-ad)^3g^3n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{18818d^4(c+dx)}-\frac{a^2bBg^3n\cdots}{\cdots}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}-\frac{bB^2(bc-ad)g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{37636d^3}-\frac{B(bc-\cdots}{\cdots}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}-\frac{bB^2(bc-ad)g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{37636d^3}-\frac{B(bc-\cdots}{\cdots}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}+\frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3n^2\log(a+bx)\cdots}{18818d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}+\frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3n^2\log(a+bx)\cdots}{18818d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}+\frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3n^2\log(a+bx)\cdots}{18818d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}+\frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3n^2\log(a+bx)\cdots}{18818d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}+\frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3n^2\log(a+bx)\cdots}{18818d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}+\frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3n^2\log(a+bx)\cdots}{18818d^4}$$

$$=-\frac{Ab^2B(bc-ad)g^3nx}{37636d^3}+\frac{B^2(bc-ad)^3g^3n^2}{18818d^4(c+dx)}+\frac{bB^2(bc-ad)^2g^3n^2\log(a+bx)\cdots}{18818d^4}$$

Mathematica [B] time = 8.93163, size = 4312, normalized size = 5.6

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^2,x]
```

```
[Out] -((b^2*(2*b*c - 3*a*d)*g^3*x*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log
[(a + b*x)/(c + d*x)]))^2)/(d^3*i^2)) + (b^3*g^3*x^2*(A + B*(Log[e*((a + b*
x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))^2)/(2*d^2*i^2) + (A^2*b^3*c
^3*g^3 - 3*a*A^2*b^2*c^2*d*g^3 + 3*a^2*A^2*b*c*d^2*g^3 - a^3*A^2*d^3*g^3 +
2*A*b^3*B*c^3*g^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*
x)]) - 6*a*A*b^2*B*c^2*d*g^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b
*x)/(c + d*x)]) + 6*a^2*A*b*B*c*d^2*g^3*(Log[e*((a + b*x)/(c + d*x))^n] - n
*Log[(a + b*x)/(c + d*x)]) - 2*a^3*A*B*d^3*g^3*(Log[e*((a + b*x)/(c + d*x))
^n] - n*Log[(a + b*x)/(c + d*x)]) + b^3*B^2*c^3*g^3*(Log[e*((a + b*x)/(c +
d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2 - 3*a*b^2*B^2*c^2*d*g^3*(Log[e*((a
 + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2 + 3*a^2*b*B^2*c*d^2*g
^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2 - a^3*B^
2*d^3*g^3*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/
(d^4*i^2*(c + d*x)) + (3*b*(b*c - a*d)^2*g^3*(A + B*(Log[e*((a + b*x)/(c +
d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))^2*Log[c + d*x])/(d^4*i^2) + (2*a^3*
B*g^3*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]
))*(((c/d + x)*(Log[c/d + x] + Log[c/d + x]^2))/((c + d*x)^2*Log[c/d + x])
+ ((d*(a/b + x)*Log[a/b + x])/((-c + (a*d)/b)^2*(1 - (d*(a/b + x))/(-c + (a
*d)/b))) + Log[1 - (d*(a/b + x))/(-c + (a*d)/b)]/(-c + (a*d)/b))/d - (-Log[
a/b + x] + Log[c/d + x] + Log[a/(c + d*x) + (b*x)/(c + d*x)])/(d*(c + d*x))
))/i^2 + (2*b^3*B*g^3*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a +
 b*x)/(c + d*x)]))*((-2*c*(a/b + x)*(-1 + Log[a/b + x]))/d^3 + (2*c*(c/d +
x)*(-1 + Log[c/d + x]))/d^3 - (3*c^2*Log[c/d + x]^2)/(2*d^4) - (c^3*(1 + Lo
g[c/d + x]))/(d^4*(c + d*x)) + ((a*x)/(2*b) - x^2/4 + (x^2*Log[a/b + x])/2
- (a^2*Log[a + b*x])/(2*b^2))/d^2 - ((c*x)/(2*d) - x^2/4 + (x^2*Log[c/d + x
])/2 - (c^2*Log[c + d*x])/(2*d^2))/d^2 - (c^3*(-(Log[a/b + x]/(d*(c + d*x))
) + (b*(Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/d))/d^3 + ((-
4*c*d*x + d^2*x^2 + (2*c^3)/(c + d*x) + 6*c^2*Log[c + d*x])*(-Log[a/b + x]
+ Log[c/d + x] + Log[a/(c + d*x) + (b*x)/(c + d*x)]))/(2*d^4) + (3*c^2*((Lo
g[a/b + x]*Log[(c + d*x)/(c - (a*d)/b)])/d + PolyLog[2, (b*d*(a/b + x))/(-(
b*c) + a*d)]/d))/d^3))/i^2 + (6*a*b^2*B*g^3*n*(A + B*(Log[e*((a + b*x)/(c +
 d*x))^n] - n*Log[(a + b*x)/(c + d*x)]))*(((a/b + x)*(-1 + Log[a/b + x]))/d
^2 - ((c/d + x)*(-1 + Log[c/d + x]))/d^2 + (c*Log[c/d + x]^2)/d^3 + (c^2*(1
 + Log[c/d + x]))/(d^3*(c + d*x)) + (c^2*(-(Log[a/b + x]/(d*(c + d*x))) + (
b*(Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/d))/d^2 + ((d*x -
c^2/(c + d*x) - 2*c*Log[c + d*x])*(-Log[a/b + x] + Log[c/d + x] + Log[a/(c
+ d*x) + (b*x)/(c + d*x)]))/d^3 - (2*c*((Log[a/b + x]*Log[(c + d*x)/(c - (a
*d)/b)])/d + PolyLog[2, (b*d*(a/b + x))/(-(b*c) + a*d)]/d))/d^2))/i^2 + (6*
a^2*b*B*g^3*n*(A + B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c +
 d*x)]))*(-Log[c/d + x]^2/(2*d^2) - (c*(1 + Log[c/d + x]))/(d^2*(c + d*x))
- (c*(-(Log[a/b + x]/(d*(c + d*x))) + (b*(Log[a + b*x]/(b*c - a*d) - Log[c
+ d*x]/(b*c - a*d)))/d))/d + ((c/(c + d*x) + Log[c + d*x])*(-Log[a/b + x] +
 Log[c/d + x] + Log[a/(c + d*x) + (b*x)/(c + d*x)]))/d^2 + ((Log[a/b + x]*L
og[(c + d*x)/(c - (a*d)/b)])/d + PolyLog[2, (b*d*(a/b + x))/(-(b*c) + a*d)]
/d)/d))/i^2 - (a^3*B^2*g^3*n^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x]
- 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(
a + b*x)/(c + d*x)] + (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 - 2*b*(c + d*x
)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*
c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))
/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*
```

```
(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[
(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(d
*(b*c - a*d)*i^2*(c + d*x)) + (3*a*b^2*B^2*g^3*n^2*((d*(a + b*x)*Log[(a + b
*x)/(c + d*x)]^2)/b - (c^2*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) + 2*c*Log[
(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (c^2*(2*b*c - 2*a*d
 + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*
b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d
*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
 + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c -
 a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)
/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*
(c + d*x)) - ((b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*
x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*c + b
*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b + 4*c*(Log[(a + b*x)/
(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x
))/(b*(c + d*x))])))/(d^3*i^2) + (b^3*B^2*g^3*n^2*(d^2*x^2*Log[(a + b*x)/(c
 + d*x)]^2 - (4*c*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2)/b + (2*c^3*Log[(a
 + b*x)/(c + d*x)]^2)/(c + d*x) - 6*c^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c
 - a*d)/(b*c + b*d*x)] - (2*d*(b*c - a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)
] + 2*a^2*d^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*(b*c - a*d)^2*Log[c
 + d*x] + 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
 - a^2*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - b^2*c^2*(Log[(b*c - a*d)/(b
*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c +
b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b^2 + (2*c^3*(2*b*c -
2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)]
 - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[
c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*
d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
- a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(
b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c -
 a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c -
a*d)*(c + d*x)) + (4*c*(b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(
d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)
/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b - 12*c^2*(Lo
g[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3,
 (d*(a + b*x))/(b*(c + d*x))])))/(2*d^4*i^2) + (3*a^2*b*B^2*g^3*n^2*((c*Log
[(a + b*x)/(c + d*x)]^2)/(c + d*x) - Log[(a + b*x)/(c + d*x)]^2*Log[(b*c -
a*d)/(b*c + b*d*x)] - 2*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(
b*(c + d*x))] + (c*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a
*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c
+ d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x
)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/
(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + 2*PolyLog[3, (d*(a + b*x))/(b
*(c + d*x))]))/(d^2*i^2)
```

Maple [F] time = 0.715, size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^3}{(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] 2*A*B*a^3*g^3*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*
i^2) - b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) + 1/2*(2*c^3/(d^5*i^2*x + c*d^
4*i^2) + 6*c^2*log(d*x + c)/(d^4*i^2) + (d*x^2 - 4*c*x)/(d^3*i^2))*A^2*b^3*
g^3 - 3*A^2*a*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x
+ c)/(d^3*i^2))*g^3 + 3*A^2*a^2*b*g^3*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x
+ c)/(d^2*i^2)) - 2*A*B*a^3*g^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^2
*i^2*x + c*d*i^2) - A^2*a^3*g^3/(d^2*i^2*x + c*d*i^2) + 1/2*(B^2*b^3*d^3*g^
3*x^3 - 3*(b^3*c*d^2*g^3 - 2*a*b^2*d^3*g^3)*B^2*x^2 - 2*(2*b^3*c^2*d*g^3 -
3*a*b^2*c*d^2*g^3)*B^2*x + 2*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d
^2*g^3 - a^3*d^3*g^3)*B^2 + 6*((b^3*c^2*d*g^3 - 2*a*b^2*c*d^2*g^3 + a^2*b*d
^3*g^3)*B^2*x + (b^3*c^3*g^3 - 2*a*b^2*c^2*d*g^3 + a^2*b*c*d^2*g^3)*B^2)*lo
g(d*x + c))*log((d*x + c)^n)^2/(d^5*i^2*x + c*d^4*i^2) - integrate(-(B^2*a^
3*d^3*g^3*log(e)^2 + (B^2*b^3*d^3*g^3*log(e)^2 + 2*A*B*b^3*d^3*g^3*log(e))*
x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e)^2 + 2*A*B*a*b^2*d^3*g^3*log(e))*x^2 + (B^
2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a
^3*d^3*g^3)*log((b*x + a)^n)^2 + 3*(B^2*a^2*b*d^3*g^3*log(e)^2 + 2*A*B*a^2*
b*d^3*g^3*log(e))*x + 2*(B^2*a^3*d^3*g^3*log(e) + (B^2*b^3*d^3*g^3*log(e) +
 A*B*b^3*d^3*g^3)*x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e) + A*B*a*b^2*d^3*g^3)*x^
2 + 3*(B^2*a^2*b*d^3*g^3*log(e) + A*B*a^2*b*d^3*g^3)*x)*log((b*x + a)^n) -
((2*A*B*b^3*d^3*g^3 + (g^3*n + 2*g^3*log(e))*B^2*b^3*d^3)*x^3 + 2*(b^3*c^3*
g^3*n - 3*a*b^2*c^2*d*g^3*n + 3*a^2*b*c*d^2*g^3*n - (g^3*n - g^3*log(e))*a^
3*d^3)*B^2 + 3*(2*A*B*a*b^2*d^3*g^3 - (b^3*c*d^2*g^3*n - 2*(g^3*n + g^3*log
(e))*a*b^2*d^3)*B^2)*x^2 + 2*(3*A*B*a^2*b*d^3*g^3 - (2*b^3*c^2*d*g^3*n - 3*
a*b^2*c*d^2*g^3*n - 3*a^2*b*d^3*g^3*log(e))*B^2)*x + 6*((b^3*c^2*d*g^3*n -
2*a*b^2*c*d^2*g^3*n + a^2*b*d^3*g^3*n)*B^2*x + (b^3*c^3*g^3*n - 2*a*b^2*c^2
*d*g^3*n + a^2*b*c*d^2*g^3*n)*B^2)*log(d*x + c) + 2*(B^2*b^3*d^3*g^3*x^3 +
3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*log((b*x
 + a)^n))*log((d*x + c)^n))/(d^5*i^2*x^2 + 2*c*d^4*i^2*x + c^2*d^3*i^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\right.}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a
^3*g^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2
*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log(e*((b*x + a)/(d*x + c))^n))
/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(dix + ci)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x +
 c*i)^2, x)
```

3.195 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=500

$$\frac{4bBg^2n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^2}+\frac{2bB^2g^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}-\frac{4bB^2g^2n^2(}{}$$

```
[Out] (-2*A*B*(b*c - a*d)*g^2*n*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B^2*(b*c - a*
d)*g^2*n^2*(a + b*x))/(d^2*i^2*(c + d*x)) - (2*B^2*(b*c - a*d)*g^2*n*(a + b
*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^2*(c + d*x)) + (b*g^2*(a + b*x)*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2) + ((b*c - a*d)*g^2*(a +
 b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2*(c + d*x)) + (2*b*
B*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/
(b*(c + d*x))])/(d^3*i^2) + (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^2) + (2*b*B^2*(b*c -
a*d)*g^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) + (4*b*B*(b
*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b
*x))/(b*(c + d*x))])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*n^2*PolyLog[3, (d
*(a + b*x))/(b*(c + d*x))])/(d^3*i^2)
```

Rubi [B] time = 4.98144, antiderivative size = 1807, normalized size of antiderivative = 3.61, number of steps used = 89, number of rules used = 26, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.578, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*g^2*n^2)/(d^3*i^2*(c + d*x)) - (2*b*B^2*(b*c - a*d)*g
^2*n^2*Log[a + b*x])/(d^3*i^2) - (a*b*B^2*g^2*n^2*Log[a + b*x]^2)/(d^2*i^2)
 - (b*B^2*(b*c - a*d)*g^2*n^2*Log[a + b*x]^2)/(d^3*i^2) + (2*B*(b*c - a*d)^
2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^2*(c + d*x)) + (2*a*
b*B*g^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2) +
(2*b*B*(b*c - a*d)*g^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
))/(d^3*i^2) + (b^2*g^2*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^
2) - ((b*c - a*d)^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i^2*
(c + d*x)) + (2*b*B^2*(b*c - a*d)*g^2*n^2*Log[c + d*x])/(d^3*i^2) + (4*A*b*
B*(b*c - a*d)*g^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3*i^
2) + (2*b^2*B^2*c*g^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(
d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*L
og[c + d*x])/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*Log[(a + b*x)^n]^2*Log[c
+ d*x])/(d^3*i^2) - (2*b^2*B*c*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
*Log[c + d*x])/(d^3*i^2) - (2*b*B*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])*Log[c + d*x])/(d^3*i^2) - (2*b*(b*c - a*d)*g^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/(d^3*i^2) - (2*A*b*B*(b*c - a*d)
*g^2*n*Log[c + d*x]^2)/(d^3*i^2) - (b^2*B^2*c*g^2*n^2*Log[c + d*x]^2)/(d^3*
i^2) - (b*B^2*(b*c - a*d)*g^2*n^2*Log[c + d*x]^2)/(d^3*i^2) + (2*b*B^2*(b*c
 - a*d)*g^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/(d^3*i^2) - (2*b*B^2*(b*c - a*
d)*g^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/(d^3*i^2) - (2*b*B^
```

```
2*(b*c - a*d)*g^2*n^2*Log[c + d*x]^3)/(3*d^3*i^2) + (2*a*b*B^2*g^2*n^2*Log[
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) + (2*b*B^2*(b*c - a*d)*g
^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) - (2*b*B^2*(b
*c - a*d)*g^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^2)
+ (4*b*B^2*(b*c - a*d)*g^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])
/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(
d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(
c + d*x)^(-n)]^2)/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*n*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x)
)^n] + Log[(c + d*x)^(-n)]))/(d^3*i^2) + (2*a*b*B^2*g^2*n^2*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))])/(d^2*i^2) + (2*b*B^2*(b*c - a*d)*g^2*n^2*PolyLog
[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*n*L
og[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) + (4*A*
b*B*(b*c - a*d)*g^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) + (2
*b^2*B^2*c*g^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) + (2*b*
B^2*(b*c - a*d)*g^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) +
(4*b*B^2*(b*c - a*d)*g^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*n*(Log[(a + b*x)^n] - Log[e
*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)])/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*n^2*PolyLog[3, -((d*(a +
b*x))/(b*c - a*d))])/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*n^2*PolyLog[3, (b
*(c + d*x))/(b*c - a*d)])/(d^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

```
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
```

```
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(195c+195dx)^2}\,dx = \int\left(\frac{b^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} + \frac{(-bc+ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\cdots}{38025d^2(c+dx)^2}\cdots\right.$$

$$= \frac{\left(b^2g^2\right)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx}{38025d^2} - \frac{\left(2b(bc-ad)g^2\right)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\cdots\right.}{c+dx}\cdots}{38025d^2}\cdots$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^3(c+dx)} - \cdots$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^3(c+dx)} - \cdots$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^3(c+dx)} - \cdots$$

$$= \frac{b^2g^2x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^2} - \frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38025d^3(c+dx)} - \cdots$$

$$= \frac{2B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38025d^3(c+dx)} + \frac{2abBg^2n\log(a+bx)\left(A+B\,\mathrm{lo}\cdots\right.}{38025d^2}\cdots$$

$$= \frac{2B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38025d^3(c+dx)} + \frac{2abBg^2n\log(a+bx)\left(A+B\,\mathrm{lo}\cdots\right.}{38025d^2}\cdots$$

$$= \frac{2B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38025d^3(c+dx)} + \frac{2abBg^2n\log(a+bx)\left(A+B\,\mathrm{lo}\cdots\right.}{38025d^2}\cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} + \frac{2B(bc-ad)^2g^2n\left(\cdots\right.}{38025\cdots}$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB^2g^2n^2\log^2(a+\cdots}{38025d^2}\cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB^2g^2n^2\log^2(a+\cdots}{38025d^2}\cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB^2g^2n^2\log^2(a+\cdots}{38025d^2}\cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB^2g^2n^2\log^2(a+\cdots}{38025d^2}\cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB^2g^2n^2\log^2(a+\cdots}{38025d^2}\cdots$$

$$= -\frac{2B^2(bc-ad)^2g^2n^2}{38025d^3(c+dx)} - \frac{2bB^2(bc-ad)g^2n^2\log(a+bx)}{38025d^3} - \frac{abB^2g^2n^2\log^2(a+\cdots}{38025d^2}\cdots$$

Mathematica [B] time = 6.12345, size = 2196, normalized size = 4.39

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^2,x]
```

```
[Out] (g^2*(b^2*d*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c
+ d*x)])^2 - ((b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log
[(a + b*x)/(c + d*x)])^2)/(c + d*x) - 2*b*(b*c - a*d)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + (2*a^2*B*
d^2*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)]
)*(b*c - a*d + b*(c + d*x)*Log[a/b + x] + (-(b*c) + a*d)*Log[(a + b*x)/(c +
 d*x)] - b*c*Log[(b*(c + d*x))/(b*c - a*d)] - b*d*x*Log[(b*(c + d*x))/(b*c
- a*d)]))/((-(b*c) + a*d)*(c + d*x)) + 2*a*b*B*d*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-Log[c/d + x]^2 + 2*Log[c/d
+ x]*Log[c + d*x] + 2*(-(c/(c + d*x)) + (b*c*Log[a + b*x])/(-(b*c) + a*d) +
 (b*c*Log[c + d*x])/(b*c - a*d) - Log[a/b + x]*Log[c + d*x] + Log[(a + b*x)
/(c + d*x)]*(c/(c + d*x) + Log[c + d*x]) + Log[a/b + x]*Log[(b*(c + d*x))/(
b*c - a*d)]) + 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*n*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(d*(a/b +
 x)*(-1 + Log[a/b + x]) - (c^2*Log[a/b + x])/(c + d*x) - (c + d*x)*(-1 + Lo
g[c/d + x]) + c*Log[c/d + x]^2 + (c^2*(1 + Log[c/d + x]))/(c + d*x) + (b*c^
2*(Log[a + b*x] - Log[c + d*x]))/(b*c - a*d) + (-Log[a/b + x] + Log[c/d + x
] + Log[(a + b*x)/(c + d*x)])*(d*x - c^2/(c + d*x) - 2*c*Log[c + d*x]) - 2*
c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)])) - (a^2*B^2*d^2*n^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a +
b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*
Log[(a + b*x)/(c + d*x)] + (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 - 2*b*(c
+ d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d
)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c +
d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] +
 Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
))/((b*c - a*d)*(c + d*x)) + b^2*B^2*n^2*((d*(a + b*x)*Log[(a + b*x)/(c + d
*x)]^2)/b - (c^2*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) + 2*c*Log[(a + b*x)/
(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (c^2*(2*b*c - 2*a*d + 2*b*(c
+ d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x
)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*
(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c +
d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Po
lyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c
 + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*
d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x))
 - ((b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c
) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) -
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b + 4*c*(Log[(a + b*x)/(c + d*x)]
*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c +
 d*x))])) + 2*a*b*B^2*d*n^2*((c*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) - Log
[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Log[(a + b*x)/(c
 + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c - 2*a*d + 2*b*
(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c +
d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2
*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c
 + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2
*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(
b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c +
```

```
 b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*
x)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^3*i^2)
```

Maple [F] time = 0.698, size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2}{(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] 2*A*B*a^2*g^2*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*
i^2) - b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A^2*b^2*(c^2/(d^4*i^2*x + c*
d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x + c)/(d^3*i^2))*g^2 + 2*A^2*a*b*g^2*(c
/(d^3*i^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i^2)) - 2*A*B*a^2*g^2*log(e*(b
*x/(d*x + c) + a/(d*x + c))^n)/(d^2*i^2*x + c*d*i^2) - A^2*a^2*g^2/(d^2*i^2
*x + c*d*i^2) + (B^2*b^2*d^2*g^2*x^2 + B^2*b^2*c*d*g^2*x - (b^2*c^2*g^2 - 2
*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2 - 2*((b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*x + (b
^2*c^2*g^2 - a*b*c*d*g^2)*B^2)*log(d*x + c))*log((d*x + c)^n)^2/(d^4*i^2*x
+ c*d^3*i^2) - integrate(-(B^2*a^2*d^2*g^2*log(e)^2 + (B^2*b^2*d^2*g^2*log(
e)^2 + 2*A*B*b^2*d^2*g^2*log(e))*x^2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2
*g^2*x + B^2*a^2*d^2*g^2)*log((b*x + a)^n)^2 + 2*(B^2*a*b*d^2*g^2*log(e)^2
+ 2*A*B*a*b*d^2*g^2*log(e))*x + 2*(B^2*a^2*d^2*g^2*log(e) + (B^2*b^2*d^2*g^
2*log(e) + A*B*b^2*d^2*g^2)*x^2 + 2*(B^2*a*b*d^2*g^2*log(e) + A*B*a*b*d^2*g
^2)*x)*log((b*x + a)^n) + 2*((b^2*c^2*g^2*n - 2*a*b*c*d*g^2*n + (g^2*n - g^
2*log(e))*a^2*d^2)*B^2 - (A*B*b^2*d^2*g^2 + (g^2*n + g^2*log(e))*B^2*b^2*d^
2)*x^2 - (2*A*B*a*b*d^2*g^2 + (b^2*c*d*g^2*n + 2*a*b*d^2*g^2*log(e))*B^2)*x
 + 2*((b^2*c*d*g^2*n - a*b*d^2*g^2*n)*B^2*x + (b^2*c^2*g^2*n - a*b*c*d*g^2*
n)*B^2)*log(d*x + c) - (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2
*d^2*g^2)*log((b*x + a)^n))*log((d*x + c)^n))/(d^4*i^2*x^2 + 2*c*d^3*i^2*x
+ c^2*d^2*i^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABb^2g^2x^2 + 2\,ABa\right.}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^
2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*
B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^
n))/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{2}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{(dix+ci)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x +
 c*i)^2, x)
```

3.196 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=282

$$-\frac{2bBgn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^2}+\frac{2bB^2gn^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2}-\frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{d^2i^2}$$

```
[Out] (2*A*B*g*n*(a + b*x))/(d*i^2*(c + d*x)) - (2*B^2*g*n^2*(a + b*x))/(d*i^2*(c
 + d*x)) + (2*B^2*g*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d*i^2*(c +
 d*x)) - (g*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d*i^2*(c +
 d*x)) - (b*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(
c + d*x))]])/(d^2*i^2) - (2*b*B*g*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*P
olyLog[2, (d*(a + b*x))/(b*(c + d*x))]])/(d^2*i^2) + (2*b*B^2*g*n^2*PolyLog[
3, (d*(a + b*x))/(b*(c + d*x))]])/(d^2*i^2)
```

Rubi [B] time = 4.17219, antiderivative size = 1157, normalized size of antiderivative = 4.1, number of steps used = 69, number of rules used = 25, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.581, Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{bB^2gn^2\log^3(c+dx)}{3d^2i^2}+\frac{bB^2gn^2\log^2(c+dx)}{d^2i^2}+\frac{AbBgn\log^2(c+dx)}{d^2i^2}-\frac{bB^2gn^2\log(a+bx)\log^2(c+dx)}{d^2i^2}+\frac{bB^2gn\log\left(e\left(\frac{a+}{c+}\right.\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x)^
2,x]
```

```
[Out] (2*B^2*(b*c - a*d)*g*n^2)/(d^2*i^2*(c + d*x)) + (2*b*B^2*g*n^2*Log[a + b*x]
)/(d^2*i^2) + (b*B^2*g*n^2*Log[a + b*x]^2)/(d^2*i^2) - (2*B*(b*c - a*d)*g*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2*(c + d*x)) - (2*b*B*g*n*L
og[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2) + ((b*c - a*d
)*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2*(c + d*x)) - (2*b*B^
2*g*n^2*Log[c + d*x]])/(d^2*i^2) - (2*A*b*B*g*n*Log[-((d*(a + b*x))/(b*c - a
*d))]*Log[c + d*x]])/(d^2*i^2) - (2*b*B^2*g*n^2*Log[-((d*(a + b*x))/(b*c - a
*d))]*Log[c + d*x]])/(d^2*i^2) - (b*B^2*g*Log[(a + b*x)^n]^2*Log[c + d*x]])/(
d^2*i^2) + (2*b*B*g*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x]])/
(d^2*i^2) + (b*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x]])/(d^
2*i^2) + (A*b*B*g*n*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*n^2*Log[c + d*x]^2
)/(d^2*i^2) - (b*B^2*g*n^2*Log[a + b*x]*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*
g*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*n^2
*Log[c + d*x]^3)/(3*d^2*i^2) - (2*b*B^2*g*n^2*Log[a + b*x]*Log[(b*(c + d*x)
)/(b*c - a*d)]])/(d^2*i^2) + (b*B^2*g*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(
b*c - a*d)]])/(d^2*i^2) - (2*b*B^2*g*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*
x)^(-n)]])/(d^2*i^2) - (b*B^2*g*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d^2*i^2
) + (b*B^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(d^2*
i^2) + (2*b*B^2*g*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a
+ b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]]))/(d^2*i^2
) - (2*b*B^2*g*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]])/(d^2*i^2) + (2
*b*B^2*g*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]])/(d^2*
i^2) - (2*A*b*B*g*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]])/(d^2*i^2) - (2*b
*B^2*g*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]])/(d^2*i^2) - (2*b*B^2*g*n*
```

```
Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) + (2*b
*B^2*g*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)
^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) - (2*b*B^2*g*n^2*P
olyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i^2) - (2*b*B^2*g*n^2*PolyLog
[3, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

```
x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(196c+196dx)^2}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d(c+dx)^2} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d(c+dx)} \right.$$

$$= \frac{(bg)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{38416d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2}\,dx}{38416d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c}{38416d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c}{38416d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c}{38416d^2}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38416d^2(c+dx)} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(c}{38416d^2}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19208d^2(c+dx)} - \frac{bBgn\log(a+bx)\left(A+B\log\right.}{19208d^2}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19208d^2(c+dx)} - \frac{bBgn\log(a+bx)\left(A+B\log\right.}{19208d^2}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19208d^2(c+dx)} - \frac{bBgn\log(a+bx)\left(A+B\log\right.}{19208d^2}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} - \frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{19208d^2(c+dx)}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2} - \frac{B(bc-}{}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2} - \frac{B(bc-}{}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2} - \frac{B(bc-}{}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2} - \frac{B(bc-}{}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2} - \frac{B(bc-}{}$$

$$= \frac{B^2(bc-ad)gn^2}{19208d^2(c+dx)} + \frac{bB^2gn^2\log(a+bx)}{19208d^2} + \frac{bB^2gn^2\log^2(a+bx)}{38416d^2} - \frac{B(bc-}{}$$

Mathematica [B] time = 2.24838, size = 1261, normalized size = 4.47

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/
(c + d*x)])^2)/(c + d*x) + b*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Lo
g[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + (2*a*B*d*n*(-A - B*Log[e*((a + b*x
)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(b*c - a*d + b*(c + d*x)*Lo
g[a/b + x] + (-(b*c) + a*d)*Log[(a + b*x)/(c + d*x)] - b*c*Log[(b*(c + d*x)
)/(b*c - a*d)] - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]))/((-(b*c) + a*d)*(c
+ d*x)) + b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(
c + d*x)])*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c + d*x] + 2*(-(c/(c + d*x
)) + (b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c + d*x])/(b*c - a*d) - L
og[a/b + x]*Log[c + d*x] + Log[(a + b*x)/(c + d*x)]*(c/(c + d*x) + Log[c +
d*x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) - (a*B^2*d*n^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a
 + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*
x]*Log[(a + b*x)/(c + d*x)] + (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 - 2*b*
(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c -
a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c
 + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)
] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])))/((b*c - a*d)*(c + d*x)) + b*B^2*n^2*((c*Log[(a + b*x)/(c + d*x)]^2)/(
c + d*x) - Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Lo
g[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c
- 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x
)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Lo
g[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c +
b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*
c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log
[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c
 - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c
- a*d)*(c + d*x)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])))/(d^2*i^2)
```

Maple [F] time = 0.551, size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,ABagn\left(\frac{1}{d^2i^2x+cdi^2}+\frac{b\log(bx+a)}{(bcd-ad^2)i^2}-\frac{b\log(dx+c)}{(bcd-ad^2)i^2}\right)+A^2bg\left(\frac{c}{d^3i^2x+cd^2i^2}+\frac{\log(dx+c)}{d^2i^2}\right)-\frac{2\,ABag\log\left(e\left(\frac{bx}{dx+c}+\cdots\right.\right.}{d^2i^2x+cdi^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] 2*A*B*a*g*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*i^2)
 - b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) + A^2*b*g*(c/(d^3*i^2*x + c*d^2*i^
2) + log(d*x + c)/(d^2*i^2)) - 2*A*B*a*g*log(e*(b*x/(d*x + c) + a/(d*x + c)
)^n)/(d^2*i^2*x + c*d*i^2) - A^2*a*g/(d^2*i^2*x + c*d*i^2) + ((b*c*g - a*d*
g)*B^2 + (B^2*b*d*g*x + B^2*b*c*g)*log(d*x + c))*log((d*x + c)^n)^2/(d^3*i^
2*x + c*d^2*i^2) - integrate(-(B^2*a*d*g*log(e)^2 + (B^2*b*d*g*x + B^2*a*d*
g)*log((b*x + a)^n)^2 + (B^2*b*d*g*log(e)^2 + 2*A*B*b*d*g*log(e))*x + 2*(B^
2*a*d*g*log(e) + (B^2*b*d*g*log(e) + A*B*b*d*g)*x)*log((b*x + a)^n) - 2*((b
*c*g*n - (g*n - g*log(e))*a*d)*B^2 + (B^2*b*d*g*log(e) + A*B*b*d*g)*x + (B^
2*b*d*g*n*x + B^2*b*c*g*n)*log(d*x + c) + (B^2*b*d*g*x + B^2*a*d*g)*log((b*
x + a)^n))*log((d*x + c)^n))/(d^3*i^2*x^2 + 2*c*d^2*i^2*x + c^2*d*i^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABbgx + ABag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^2i^2x^2 + 2\,cdi^2x + c^2i^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log(e*((b*x + a)/(d*x
 + c))^n)^2 + 2*(A*B*b*g*x + A*B*a*g)*log(e*((b*x + a)/(d*x + c))^n))/(d^2*
i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(dix + ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c
*i)^2, x)
```

3.197 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^2}\,dx$

Optimal. Leaf size=163

$$\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(c+dx)(bc-ad)}-\frac{2ABn(a+bx)}{i^2(c+dx)(bc-ad)}-\frac{2B^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{i^2(c+dx)(bc-ad)}+\frac{2B^2n^2(a+bx)}{i^2(c+dx)(bc-ad)}$$

```
[Out] (-2*A*B*n*(a + b*x))/((b*c - a*d)*i^2*(c + d*x)) + (2*B^2*n^2*(a + b*x))/((
b*c - a*d)*i^2*(c + d*x)) - (2*B^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^
n])/((b*c - a*d)*i^2*(c + d*x)) + ((a + b*x)*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^2)/((b*c - a*d)*i^2*(c + d*x))
```

Rubi [C] time = 0.755538, antiderivative size = 514, normalized size of antiderivative = 3.15, number of steps used = 24, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2bB^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{di^2(bc-ad)}+\frac{2bB^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di^2(bc-ad)}+\frac{2bBn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di^2(bc-ad)}+\frac{2Bn\left(B\log\ldots\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-2*B^2*n^2)/(d*i^2*(c + d*x)) - (2*b*B^2*n^2*Log[a + b*x])/(d*(b*c - a*d)*
i^2) - (b*B^2*n^2*Log[a + b*x]^2)/(d*(b*c - a*d)*i^2) + (2*B*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(d*i^2*(c + d*x)) + (2*b*B*n*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(d*(b*c - a*d)*i^2) - (A + B*Log[e*((a +
 b*x)/(c + d*x))^n])^2/(d*i^2*(c + d*x)) + (2*b*B^2*n^2*Log[c + d*x])/(d*(b
*c - a*d)*i^2) + (2*b*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x
])/(d*(b*c - a*d)*i^2) - (2*b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Lo
g[c + d*x])/(d*(b*c - a*d)*i^2) - (b*B^2*n^2*Log[c + d*x]^2)/(d*(b*c - a*d)
*i^2) + (2*b*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d*(b*c -
 a*d)*i^2) + (2*b*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d*(b*c
 - a*d)*i^2) + (2*b*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*(b*c
- a*d)*i^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(197c+197dx)^2}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{197(a+bx)(c+dx)^2}dx}{197d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^2}dx}{38809d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} + \frac{(2B(bc-ad)n)\int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{(bc-ad)(c+dx)}\right.}{38809d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c+dx)} - \frac{(2Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}dx}{38809} - \frac{(2bBn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{c+dx}}{38809(bc-ad)}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc-ad)} - \frac{(A+B}{38}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc-ad)} - \frac{(A+B}{38}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc-ad)} - \frac{(A+B}{38}$$

$$= -\frac{2B^2n^2}{38809d(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{38809d(bc-ad)} + \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c+dx)} + \frac{2bBn\log}{}$$

$$= -\frac{2B^2n^2}{38809d(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{38809d(bc-ad)} - \frac{bB^2n^2\log^2(a+bx)}{38809d(bc-ad)} + \frac{2Bn\left(A+B\log\left(e\right.\right.}{38809d(c+}$$

$$= -\frac{2B^2n^2}{38809d(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{38809d(bc-ad)} - \frac{bB^2n^2\log^2(a+bx)}{38809d(bc-ad)} + \frac{2Bn\left(A+B\log\left(e\right.\right.}{38809d(c+}$$

Mathematica [C] time = 0.466976, size = 331, normalized size = 2.03

$$\frac{Bn\left(-bBn(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bBn(c+dx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^2,x]
```

```
[Out] (-(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*
Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
 d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*n*
(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(d*i^2*(c + d*x
```

```
))
```

Maple [F] time = 0.532, size = 0, normalized size = 0.

$$\int \frac{1}{(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 1.30244, size = 578, normalized size = 3.55

$$2\,ABn\left(\frac{1}{d^2i^2x+cdi^2}+\frac{b\log(bx+a)}{(bcd-ad^2)i^2}-\frac{b\log(dx+c)}{(bcd-ad^2)i^2}\right)+\left(2\,n\left(\frac{1}{d^2i^2x+cdi^2}+\frac{b\log(bx+a)}{(bcd-ad^2)i^2}-\frac{b\log(dx+c)}{(bcd-ad^2)i^2}\right)\log\left(e\left(\frac{bx}{dx+\cdots}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="ma
xima")
```

```
[Out] 2*A*B*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*i^2) - b
*log(d*x + c)/((b*c*d - a*d^2)*i^2)) + (2*n*(1/(d^2*i^2*x + c*d*i^2) + b*lo
g(b*x + a)/((b*c*d - a*d^2)*i^2) - b*log(d*x + c)/((b*c*d - a*d^2)*i^2))*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n) - ((b*d*x + b*c)*log(b*x + a)^2 + (b*d
*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2
*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*n^2/(b*c^2*d*i^2
- a*c*d^2*i^2 + (b*c*d^2*i^2 - a*d^3*i^2)*x))*B^2 - B^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(d^2*i^2*x + c*d*i^2) - 2*A*B*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n)/(d^2*i^2*x + c*d*i^2) - A^2/(d^2*i^2*x + c*d*i^2)
```

Fricas [A] time = 0.529081, size = 555, normalized size = 3.4

$$-\frac{A^2bc-A^2ad+2\left(B^2bc-B^2ad\right)n^2+\left(B^2bc-B^2ad\right)\log(e)^2-\left(B^2bdn^2x+B^2adn^2\right)\log\left(\frac{bx+a}{dx+c}\right)^2-2\left(ABbc-ABad\right)n+2\cdots}{\left(bcd^2-ad\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="fr
icas")
```

```
[Out] -(A^2*b*c - A^2*a*d + 2*(B^2*b*c - B^2*a*d)*n^2 + (B^2*b*c - B^2*a*d)*log(e
)^2 - (B^2*b*d*n^2*x + B^2*a*d*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(A*B*b*c
 - A*B*a*d)*n + 2*(A*B*b*c - A*B*a*d - (B^2*b*c - B^2*a*d)*n - (B^2*b*d*n*x
 + B^2*a*d*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*(B^2*a*d*n^2 - A*B*a*d*n
 + (B^2*b*d*n^2 - A*B*b*d*n)*x)*log((b*x + a)/(d*x + c)))/((b*c*d^2 - a*d^3
```

```
)*i^2*x + (b*c^2*d - a*c*d^2)*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A\right)^{2}}{(dix + ci)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i)^2, x)
```

3.198 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^2}\,dx$

Optimal. Leaf size=231

$$\frac{b\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bgi^2n(bc-ad)^2}-\frac{d(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{gi^2(c+dx)(bc-ad)^2}+\frac{2ABdn(a+bx)}{gi^2(c+dx)(bc-ad)^2}+\frac{2B^2dn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi^2(c+dx)(bc-ad)^2}$$

```
[Out] (2*A*B*d*n*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) - (2*B^2*d*n^2*(a + b
*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) + (2*B^2*d*n*(a + b*x)*Log[e*((a + b*x
)/(c + d*x))^n])/((b*c - a*d)^2*g*i^2*(c + d*x)) - (d*(a + b*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^2*g*i^2*n)
```

Rubi [C] time = 6.11183, antiderivative size = 1803, normalized size of antiderivative = 7.81, number of steps used = 83, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*i*x)^2
),x]
```

```
[Out] (2*B^2*n^2)/((b*c - a*d)*g*i^2*(c + d*x)) + (2*b*B^2*n^2*Log[a + b*x])/((b*
c - a*d)^2*g*i^2) - (A*b*B*n*Log[a + b*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2
*n^2*Log[a + b*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[-((b*c - a*d)/(d*(a
 + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2
*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^2*g*i^2) - (2*
B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*g*i^2*(c + d*x)) -
 (2*b*B*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)
^2*g*i^2) + (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((b*c - a*d)*g*i^2*(c
+ d*x)) + (b*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c -
 a*d)^2*g*i^2) - (2*b*B^2*n^2*Log[c + d*x])/((b*c - a*d)^2*g*i^2) + (2*A*b*
B*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^2*g*i^2) -
 (2*b*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^
2*g*i^2) + (b*B^2*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^2*g*i^2) +
(2*b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^
2*g*i^2) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c
- a*d)^2*g*i^2) - (A*b*B*n*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*n
^2*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*n^2*Log[a + b*x]*Log[c +
d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log
[c + d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*n^2*Log[c + d*x]^3)/(3*(b*c - a
*d)^2*g*i^2) + (2*A*b*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*
c - a*d)^2*g*i^2) - (2*b*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)
])/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c
 - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n*Log[a + b*x]*Log[c + d*x]*Log[
(c + d*x)^(-n)])/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b*x]*Log[(c + d*x)^
(-n)]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*L
og[(c + d*x)^(-n)]^2)/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x)
```

```
)^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^2*g*i^2) + (2*A*b*B*n*PolyLog[2,
-((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n^2*PolyLog
[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n*Log[(
a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2)
 + (2*A*b*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2)
- (2*b*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2)
 + (2*b*B^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((
b*c - a*d)^2*g*i^2) - (2*b*B^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c +
d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*
c - a*d)^2*g*i^2) + (2*b*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1
+ (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n^2*PolyLog[
3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n^2*Poly
Log[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n^2*Pol
yLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
```

```
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
```

```
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(198c+198dx)^2(ag+bgx)}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)^2} - \frac{bd\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+\cdots}\right.\right.\right.}{39204(bc-ad)^2g(c\cdots}\right.$$

$$= \frac{b^2\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{39204(bc-ad)^2g} - \frac{(bd)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{39204(bc-ad)^2g} - \frac{d\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2}\,dx}{39204(bc-ad)g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b\left(A+B\log\left(e\cdots\right.\right.}{3920\cdots}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b\left(A+B\log\left(e\cdots\right.\right.}{3920\cdots}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b\left(A+B\log\left(e\cdots\right.\right.}{3920\cdots}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)g(c+dx)} + \frac{b\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc-ad)^2g} - \frac{b\left(A+B\log\left(e\cdots\right.\right.}{3920\cdots}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc-ad)^2g} + \frac{\left(A+B\,\mathrm{lo}\cdots\right.}{39204(bc\cdots}$$

$$= -\frac{bB^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc-ad)^2g} - \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc-ad)g(c+dx)} - \frac{bBn\log(a+bx)\left(\cdots\right.}{19602\cdots}$$

$$= -\frac{bB^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc-ad)^2g} - \frac{bB^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc-ad)^2g} - \frac{Bn\left(A+B\cdots\right.}{19602(bc\cdots}$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} - \frac{bB^2\log\left(-\frac{bc-\cdots}{d(a+\cdots}\right.}{39204\cdots}$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} + \frac{bB^2n^2\log^2(a\cdots}{39204(bc-a\cdots}$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} + \frac{bB^2n^2\log^2(a\cdots}{39204(bc-a\cdots}$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} + \frac{bB^2n^2\log^2(a\cdots}{39204(bc-a\cdots}$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} + \frac{bB^2n^2\log^2(a\cdots}{39204(bc-a\cdots}$$

$$= \frac{B^2n^2}{19602(bc-ad)g(c+dx)} + \frac{bB^2n^2\log(a+bx)}{19602(bc-ad)^2g} - \frac{AbBn\log^2(a+bx)}{39204(bc-ad)^2g} + \frac{bB^2n^2\log^2(a\cdots}{39204(bc-a\cdots}$$

Mathematica [B] time = 0.950208, size = 789, normalized size = 3.42

$$\frac{b\log(a+bx)\left(2AB\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)+B^2\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\log\left(\frac{a+bx}{c+dx}\right)\right)^2-2B^2n\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-n\right.\right.}{gi^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*
i*x)^2),x]
```

```
[Out] (b*B^2*n^2*Log[(a + b*x)/(c + d*x)]^3)/(3*(b*c - a*d)^2*g*i^2) - (2*B*n*Log
[(a + b*x)/(c + d*x)]*(-A + B*n - B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log
[(a + b*x)/(c + d*x)])))/((b*c - a*d)*g*i^2*(c + d*x)) + (Log[(a + b*x)/(c
+ d*x)]^2*(A*b*B*c*n - a*B^2*d*n^2 + A*b*B*d*n*x - b*B^2*d*n^2*x + b*B^2*c*
n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + b*B^2*d*n
*x*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])))/((b*c -
a*d)^2*g*i^2*(c + d*x)) + (A^2 - 2*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b
*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*B^2*n*(Log[e*((a + b*x)
/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d
*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)/((b*c - a*d)*g*i^2*(c + d*x)) + (b
*Log[a + b*x]*(A^2 - 2*A*B*n + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x
))^n] - n*Log[(a + b*x)/(c + d*x)]) - 2*B^2*n*(Log[e*((a + b*x)/(c + d*x))^
n] - n*Log[(a + b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*
Log[(a + b*x)/(c + d*x)])^2))/((b*c - a*d)^2*g*i^2) - (b*(A^2 - 2*A*B*n + 2
*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x
)]) - 2*B^2*n*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])
 + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2)*Log
[c + d*x])/((b*c - a*d)^2*g*i^2)
```

Maple [F] time = 0.689, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 1.52465, size = 1369, normalized size = 5.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] B^2*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/(
(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c
*d + a^2*d^2)*g*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 + 2*A*B*(1/(
```

```
(b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2
 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2
*d^2)*g*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*(((b*d*x + b*c)*
log(b*x + a)^3 - (b*d*x + b*c)*log(d*x + c)^3 + 3*(b*d*x + b*c)*log(b*x + a
)^2 + 3*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c)^2 + 6*b*c -
 6*a*d + 6*(b*d*x + b*c)*log(b*x + a) - 3*(2*b*d*x + (b*d*x + b*c)*log(b*x
+ a)^2 + 2*b*c + 2*(b*d*x + b*c)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^3*g
*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d*g*i^2 - 2*a*b*c*d^2
*g*i^2 + a^2*d^3*g*i^2)*x) - 3*((b*d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c
)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x
+ b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*n*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n)/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2
*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x))*B^2 - ((b*d*x + b*c)*
log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x +
b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x +
c))*A*B*n/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d
*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x) + A^2*(1/((b*c*d - a*d^2)*g*
i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2
*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2))
```

Fricas [A] time = 0.517245, size = 954, normalized size = 4.13

$$\frac{3\,A^2bc - 3\,A^2ad + \left(B^2bdn^2x + B^2bcn^2\right)\log\left(\frac{bx+a}{dx+c}\right)^3 + 6\left(B^2bc - B^2ad\right)n^2 + 3\left(B^2bc - B^2ad + \left(B^2bdx + B^2bc\right)\log\left(\frac{bx+a}{dx+c}\right)\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] 1/3*(3*A^2*b*c - 3*A^2*a*d + (B^2*b*d*n^2*x + B^2*b*c*n^2)*log((b*x + a)/(d
*x + c))^3 + 6*(B^2*b*c - B^2*a*d)*n^2 + 3*(B^2*b*c - B^2*a*d + (B^2*b*d*x
+ B^2*b*c)*log((b*x + a)/(d*x + c)))*log(e)^2 - 3*(B^2*a*d*n^2 - A*B*b*c*n
+ (B^2*b*d*n^2 - A*B*b*d*n)*x)*log((b*x + a)/(d*x + c))^2 - 6*(A*B*b*c - A*
B*a*d)*n + 3*(2*A*B*b*c - 2*A*B*a*d + (B^2*b*d*n*x + B^2*b*c*n)*log((b*x +
a)/(d*x + c))^2 - 2*(B^2*b*c - B^2*a*d)*n - 2*(B^2*a*d*n - A*B*b*c + (B^2*b
*d*n - A*B*b*d)*x)*log((b*x + a)/(d*x + c)))*log(e) + 3*(2*B^2*a*d*n^2 - 2*
A*B*a*d*n + A^2*b*c + (2*B^2*b*d*n^2 - 2*A*B*b*d*n + A^2*b*d)*x)*log((b*x +
 a)/(d*x + c)))/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g*i^2*x + (b^2*c^3 - 2
*a*b*c^2*d + a^2*c*d^2)*g*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(bgx+ag)(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)*(d*i*x +
c*i)^2), x)
```

3.199 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^2}\,dx$

Optimal. Leaf size=392

$$-\frac{b^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i^2(a+bx)(bc-ad)^3}-\frac{2b^2Bn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3}+\frac{d^2(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i^2(c+dx)(bc-ad)^3}-$$

```
[Out] (-2*A*B*d^2*n*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) + (2*B^2*d^2*n^2
*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B^2*n^2*(c + d*x))/(
(b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*B^2*d^2*n*(a + b*x)*Log[e*((a + b*x)/
(c + d*x))^n])/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B*n*(c + d*x)*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (d
^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^2*i
^2*(c + d*x)) - (b^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((
b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*b*d*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])^3)/(3*B*(b*c - a*d)^3*g^2*i^2*n)
```

Rubi [C] time = 6.81197, antiderivative size = 1621, normalized size of antiderivative = 4.14, number of steps used = 107, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)
^2),x]
```

```
[Out] (-2*b*B^2*n^2)/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (2*B^2*d*n^2)/((b*c - a*
d)^2*g^2*i^2*(c + d*x)) - (4*b*B^2*d*n^2*Log[a + b*x])/((b*c - a*d)^3*g^2*i
^2) + (2*A*b*B*d*n*Log[a + b*x]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*Log
[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*
d)^3*g^2*i^2) + (2*b*B^2*d*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(
(b*c - a*d)^3*g^2*i^2) - (2*b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
(b*c - a*d)^2*g^2*i^2*(a + b*x)) + (2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (b*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])^2)/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (d*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (2*b*d*Log[a + b*x
]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^2*i^2) + (4*b*
B^2*d*n^2*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*n*Log[-((d*(a
+ b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*Lo
g[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (2*b*d*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (2*A*
b*B*d*n*Log[c + d*x]^2)/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*n^2*Log[a + b*
x]*Log[c + d*x]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*n*Log[e*((a + b*x)/
(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*n^2*Log[
c + d*x]^3)/(3*(b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*n*Log[a + b*x]*Log[(b*(c
 + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*Log[(a + b*x)^n
]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*n*
Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^3*g^2*i^2) - (2
*b*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b
```

```
*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d
)^3*g^2*i^2) + (4*b*B^2*d*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*
(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/
((b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/((b*c - a*d)^3*g^2*i^2) + (4*b*B^2*d*n*Log[(a + b*x)^n]*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*n*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*n*Log[
(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i
^2) + (4*b*B^2*d*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log
[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2
*i^2) - (4*b*B^2*d*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a
*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*n^2*PolyLog[3, -((
d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*n^2*PolyLo
g[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*n^2*P
olyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^2*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
```

```
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(199c+199dx)^2(ag+bgx)^2}\,dx = \int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)^2} - \frac{2b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^3g^2(a+bx)} + \frac{d^2\left(A+B\log\left(e\right.\right.}{39601(bc-ad)^2}\right.$$

$$= -\frac{\left(2b^2d\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{39601(bc-ad)^3g^2} + \frac{\left(2bd^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{39601(bc-ad)^3g^2} + \frac{b^2\int \frac{\left(A+B\log\left(e\left(\right.\right.\right.}{(a+bx}}{39601(bc-}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\right.}{39601(bc-}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\right.}{39601(bc-}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\right.}{39601(bc-}$$

$$= -\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{2bd\log(a+bx)\left(A+B\right.}{39601(bc-}$$

$$= -\frac{2bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc-ad)^2g^2(a+bx)} + \frac{2Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc-ad)^2g^2(c+dx)} - \frac{b\left(A+B\log\left(e\left(\right.\right.\right.}{39601(bc-ad)^2g}$$

$$= \frac{2bB^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc-ad)^3g^2} - \frac{2bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc-ad)^2g^2(a+bx)} + \frac{2Bdn\left(A+B\right.}{39601(bc-}$$

$$= \frac{2bB^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc-ad)^3g^2} + \frac{2bB^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc-ad)^3g^2} - \frac{2bBn}{3960}$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn^2\log(a+bx)}{39601(bc-ad)^3g^2} +$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn^2\log(a+bx)}{39601(bc-ad)^3g^2} +$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn^2\log(a+bx)}{39601(bc-ad)^3g^2} +$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn^2\log(a+bx)}{39601(bc-ad)^3g^2} +$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn^2\log(a+bx)}{39601(bc-ad)^3g^2} +$$

$$= -\frac{2bB^2n^2}{39601(bc-ad)^2g^2(a+bx)} - \frac{2B^2dn^2}{39601(bc-ad)^2g^2(c+dx)} - \frac{4bB^2dn^2\log(a+bx)}{39601(bc-ad)^3g^2} +$$

Mathematica [B] time = 1.42337, size = 870, normalized size = 2.22

$$-\frac{2bB^2dn^2(a+bx)(c+dx)\log^3\left(\frac{a+bx}{c+dx}\right)+3Bn\left(2Ad^2x^2b^2+Bc^2nb^2+2Acdxb^2+2Bcdnxb^2+2aAcdb+2aAd^2xb-2a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i +
d*i*x)^2),x]
```

```
[Out] -(2*b*B^2*d*n^2*(a + b*x)*(c + d*x)*Log[(a + b*x)/(c + d*x)]^3 + 3*B*n*Log[
(a + b*x)/(c + d*x)]^2*(2*a*A*b*c*d + b^2*B*c^2*n - a^2*B*d^2*n + 2*A*b^2*c
*d*x + 2*a*A*b*d^2*x + 2*b^2*B*c*d*n*x - 2*a*b*B*d^2*n*x + 2*A*b^2*d^2*x^2
+ 2*b*B*d*(a + b*x)*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n] - 2*b*B*d*n*(a
 + b*x)*(c + d*x)*Log[(a + b*x)/(c + d*x)]) + 6*B*(b*c - a*d)*n*Log[(a + b*
x)/(c + d*x)]*(A*b*c + a*A*d + b*B*c*n - a*B*d*n + 2*A*b*d*x + B*(a*d + b*(
c + 2*d*x))*Log[e*((a + b*x)/(c + d*x))^n] - B*n*(b*c + a*d + 2*b*d*x)*Log[
(a + b*x)/(c + d*x)]) + 6*b*d*(a + b*x)*(c + d*x)*Log[a + b*x]*(A^2 + 2*B^2
*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])
+ B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])^2) + 3*
b*(b*c - a*d)*(c + d*x)*(A^2 + 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*x)/(
c + d*x))^n]^2 - 2*B*n*(A + B*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log[(a
+ b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(A + B*n - B*n*Log
[(a + b*x)/(c + d*x)])) + 3*d*(b*c - a*d)*(a + b*x)*(A^2 - 2*A*B*n + 2*B^2*
n^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-A + B*n)*Log[(a + b*x)
/(c + d*x)] + B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c
+ d*x))^n]*(-A + B*n + B*n*Log[(a + b*x)/(c + d*x)])) - 6*b*d*(a + b*x)*(c
+ d*x)*(A^2 + 2*B^2*n^2 + 2*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a
+ b*x)/(c + d*x)]) + B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/
(c + d*x)])^2)*Log[c + d*x])/(3*(b*c - a*d)^3*g^2*i^2*(a + b*x)*(c + d*x))
```

Maple [F] time = 0.696, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2(dix+ci)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 1.83143, size = 2708, normalized size = 6.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] -B^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^
2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*
c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 -
3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2))*log(e*(b*x/(d*x
+ c) + a/(d*x + c))^n)^2 - 2*A*B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b
^2*c*d^2 + a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 +
a^3*d^3)*g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b
*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^
2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3
)*g^2*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 2/3*((3*b^2*c^2 - 3*a^
2*d^2 + (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^3 + 3*
(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c)^2
 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^3 + 6*(b^2*
c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*
x + a) - 3*(2*b^2*d^2*x^2 + 2*a*b*c*d + (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d +
 a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c*d + a*b*d^2)*x)*log(d*x + c))*n^2/(a
*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*
c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 - 3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*
d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2 + (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2
*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^4*g^2*i^2)*x) + 3*(b^2*c^2 - 2*a*b*c*d
 + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2
 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x +
 c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*n*log
(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^
2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 -
3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2
+ (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^
4*g^2*i^2)*x))*B^2 - 2*(b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*
c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b
^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (
b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*A*B*n/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*
c^3*d*g^2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^
2*i^2 - 3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i
^2)*x^2 + (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2
- a^4*d^4*g^2*i^2)*x) - A^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*
d^2 + a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d
^3)*g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*lo
g(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) -
2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2
*i^2))
```

Fricas [B] time = 0.585958, size = 2006, normalized size = 5.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] -1/3*(3*A^2*b^2*c^2 - 3*A^2*a^2*d^2 + 2*(B^2*b^2*d^2*n^2*x^2 + B^2*a*b*c*d*
n^2 + (B^2*b^2*c*d + B^2*a*b*d^2)*n^2*x)*log((b*x + a)/(d*x + c))^3 + 6*(B^
2*b^2*c^2 - B^2*a^2*d^2)*n^2 + 3*(B^2*b^2*c^2 - B^2*a^2*d^2 + 2*(B^2*b^2*c*
d - B^2*a*b*d^2)*x + 2*(B^2*b^2*d^2*x^2 + B^2*a*b*c*d + (B^2*b^2*c*d + B^2*
a*b*d^2)*x)*log((b*x + a)/(d*x + c)))*log(e)^2 + 3*(2*A*B*b^2*d^2*n*x^2 + 2
*A*B*a*b*c*d*n + (B^2*b^2*c^2 - B^2*a^2*d^2)*n^2 + 2*((B^2*b^2*c*d - B^2*a*
```

```
b*d^2)*n^2 + (A*B*b^2*c*d + A*B*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c))^2 +
 6*(A*B*b^2*c^2 - 2*A*B*a*b*c*d + A*B*a^2*d^2)*n + 6*(A^2*b^2*c*d - A^2*a*b
*d^2 + 2*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2)*x + 6*(A*B*b^2*c^2 - A*B*a^2*d^2
+ (B^2*b^2*d^2*n*x^2 + B^2*a*b*c*d*n + (B^2*b^2*c*d + B^2*a*b*d^2)*n*x)*log
((b*x + a)/(d*x + c))^2 + (B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2)*n + 2
*(A*B*b^2*c*d - A*B*a*b*d^2)*x + (2*A*B*b^2*d^2*x^2 + 2*A*B*a*b*c*d + (B^2*
b^2*c^2 - B^2*a^2*d^2)*n + 2*(A*B*b^2*c*d + A*B*a*b*d^2 + (B^2*b^2*c*d - B^
2*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c)))*log(e) + 6*(A^2*a*b*c*d + (B^2*b
^2*c^2 + B^2*a^2*d^2)*n^2 + (2*B^2*b^2*d^2*n^2 + A^2*b^2*d^2)*x^2 + (A*B*b^
2*c^2 - A*B*a^2*d^2)*n + (A^2*b^2*c*d + A^2*a*b*d^2 + 2*(B^2*b^2*c*d + B^2*
a*b*d^2)*n^2 + 2*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c))
)/((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*i^2*x^2
+ (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^2*i^2*x + (a*b^3*c^
4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*g^2*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{\left(bgx+ag\right)^2(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^2*(d*i*x
+ c*i)^2), x)
```

3.200 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^2}\,dx$

Optimal. Leaf size=560

$$-\frac{b^3(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3i^2(a+bx)^2(bc-ad)^4}-\frac{b^3Bn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4}+\frac{3b^2d(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3i^2(a+bx)(bc-ad)^4}$$

```
[Out] (2*A*B*d^3*n*(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) - (2*B^2*d^3*n^2*
(a + b*x))/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (6*b^2*B^2*d*n^2*(c + d*x))/
((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B^2*n^2*(c + d*x)^2)/(4*(b*c - a*d
)^4*g^3*i^2*(a + b*x)^2) + (2*B^2*d^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x
))^n])/((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (6*b^2*B*d*n*(c + d*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*B*n
*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^3*i
^2*(a + b*x)^2) - (d^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/
((b*c - a*d)^4*g^3*i^2*(c + d*x)) + (3*b^2*d*(c + d*x)*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^3*i^2*(a + b*x)) - (b^3*(c + d*x)^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^4*g^3*i^2*(a + b*x
)^2) + (b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(B*(b*c - a*d)^4*g^
3*i^2*n)
```

Rubi [C] time = 8.15022, antiderivative size = 2207, normalized size of antiderivative = 3.94, number of steps used = 135, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)
^2),x]
```

```
[Out] -(b*B^2*n^2)/(4*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (11*b*B^2*d*n^2)/(2*(b
*c - a*d)^3*g^3*i^2*(a + b*x)) + (2*B^2*d^2*n^2)/((b*c - a*d)^3*g^3*i^2*(c
+ d*x)) + (15*b*B^2*d^2*n^2*Log[a + b*x])/(2*(b*c - a*d)^4*g^3*i^2) - (3*A*
b*B*d^2*n*Log[a + b*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*n^2*Log[a
+ b*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[-((b*c - a*d)/(d*(a
+ b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*
B^2*d^2*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^3*i
^2) - (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^2*g^3*i
^2*(a + b*x)^2) + (5*b*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c
- a*d)^3*g^3*i^2*(a + b*x)) - (2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*B*d^2*n*Log[a + b*x]*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^2) - (b*(A + B*Log[e*
((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (2*b*d
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^3*i^2*(a + b*x)
) + (d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^3*i^2*(
c + d*x)) + (3*b*d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)
/((b*c - a*d)^4*g^3*i^2) - (15*b*B^2*d^2*n^2*Log[c + d*x])/(2*(b*c - a*d)^4
*g^3*i^2) + (6*A*b*B*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/
((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))
```

```
]*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[(a + b*x)^n]^2*L
og[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*n*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*d^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*A
*b*B*d^2*n*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*n^2*Log[c
 + d*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*Log[a + b*x]*Log[c
+ d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*n*Log[e*((a + b*x)/(c + d*
x))^n]*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (b*B^2*d^2*n^2*Log[c + d*x
]^3)/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*n*Log[a + b*x]*Log[(b*(c + d*x)
)/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[(a
+ b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*
B^2*d^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^4*g^3
*i^2) + (3*b*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^3
*i^2) - (3*b*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^
2)/((b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d)
)]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c
 + d*x)^(-n)]))/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*n*PolyLog[2, -((d*(a
 + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*n*
Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g
^3*i^2) + (6*A*b*B*d^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d
)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*
c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*n*(Log[(a + b*x
)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n*Log[e*((a
 + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*
d)^4*g^3*i^2) + (6*b*B^2*d^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/
((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c -
a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n^2*PolyLog[3, 1 + (b*c - a*d
)/(d*(a + b*x))])/((b*c - a*d)^4*g^3*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
```

```
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
```

```
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(200c+200dx)^2(ag+bgx)^3}\,dx=\int\left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc-ad)^2g^3(a+bx)^3}-\frac{b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)^2}+\frac{3b^2d^2\left(A+B\log \cdots\right.}{40000(bc-ad\cdots}\right.$$

$$=\frac{\left(3b^2d^2\right)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{40000(bc-ad)^4g^3}-\frac{\left(3bd^3\right)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{40000(bc-ad)^4g^3}-\frac{\left(b^2d\right)\int\frac{\left(A+B\log\cdots\right.}{(a\cdots}}{20000(bc-\cdots}$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2\left(A+B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.}{40000(bc-ad)^3g^3(\cdots}$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2\left(A+B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.}{40000(bc-ad)^3g^3(\cdots}$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2\left(A+B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.}{40000(bc-ad)^3g^3(\cdots}$$

$$=-\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc-ad)^3g^3(a+bx)}+\frac{d^2\left(A+B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.}{40000(bc-ad)^3g^3(\cdots}$$

$$=-\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bBdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8000(bc-ad)^3g^3(a+bx)}-\frac{Bd^2n\left(A+B\log\cdots\right.}{20000(bc-ad)^3\cdots}$$

$$=-\frac{3bB^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc-ad)^4g^3}-\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{80000(bc-ad)^2g^3(a+bx)^2}+\frac{bBdn\left(A+\cdots\right.}{8000(bc-\cdots}$$

$$=-\frac{3bB^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc-ad)^4g^3}-\frac{3bB^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc-ad)^4g^3}-\frac{bB\cdots}{80\cdots}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{B^2d^2n^2}{20000(bc-ad)^3g^3(c\cdots}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{B^2d^2n^2}{20000(bc-ad)^3g^3(c\cdots}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{B^2d^2n^2}{20000(bc-ad)^3g^3(c\cdots}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{B^2d^2n^2}{20000(bc-ad)^3g^3(c\cdots}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{B^2d^2n^2}{20000(bc-ad)^3g^3(c\cdots}$$

$$=-\frac{bB^2n^2}{160000(bc-ad)^2g^3(a+bx)^2}+\frac{11bB^2dn^2}{80000(bc-ad)^3g^3(a+bx)}+\frac{B^2d^2n^2}{20000(bc-ad)^3g^3(c\cdots}$$

Mathematica [B] time = 2.03362, size = 1340, normalized size = 2.39

$$\frac{4bB^2d^2n^2(a+bx)^2(c+dx)\log^3\left(\frac{a+bx}{c+dx}\right)+2Bn\left(6Ad^3x^3b^3+3Bd^3nx^3b^3+6Acd^2x^2b^3+9Bcd^2nx^2b^3-Bc^3nb^3+3Bc^2d\ldots\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i +
d*i*x)^2),x]
```

```
[Out] (4*b*B^2*d^2*n^2*(a + b*x)^2*(c + d*x)*Log[(a + b*x)/(c + d*x)]^3 + 2*B*n*L
og[(a + b*x)/(c + d*x)]^2*(6*a^2*A*b*c*d^2 - b^3*B*c^3*n + 6*a*b^2*B*c^2*d*
n - 2*a^3*B*d^3*n + 12*a*A*b^2*c*d^2*x + 6*a^2*A*b*d^3*x + 3*b^3*B*c^2*d*n*
x + 12*a*b^2*B*c*d^2*n*x - 6*a^2*b*B*d^3*n*x + 6*A*b^3*c*d^2*x^2 + 12*a*A*b
^2*d^3*x^2 + 9*b^3*B*c*d^2*n*x^2 + 6*A*b^3*d^3*x^3 + 3*b^3*B*d^3*n*x^3 + 6*
b*B*d^2*(a + b*x)^2*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n] - 6*b*B*d^2*n*
(a + b*x)^2*(c + d*x)*Log[(a + b*x)/(c + d*x)]) + 2*b*d*(b*c - a*d)*(a + b*
x)*(c + d*x)*(4*A^2 + 10*A*B*n + 11*B^2*n^2 + 4*B^2*Log[e*((a + b*x)/(c + d
*x))^n]^2 - 2*B*n*(4*A + 5*B*n)*Log[(a + b*x)/(c + d*x)] + 4*B^2*n^2*Log[(a
 + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(4*A + 5*B*n - 4*
B*n*Log[(a + b*x)/(c + d*x)])) - b*(b*c - a*d)^2*(c + d*x)*(2*A^2 + 2*A*B*n
 + B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log
[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((
a + b*x)/(c + d*x))^n]*(2*A + B*n - 2*B*n*Log[(a + b*x)/(c + d*x)])) + 6*b*
d^2*(a + b*x)^2*(c + d*x)*Log[a + b*x]*(2*A^2 + 2*A*B*n + 5*B^2*n^2 + 2*B^2
*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a + b*x)/(c + d*
x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x)
)^n]*(2*A + B*n - 2*B*n*Log[(a + b*x)/(c + d*x)])) + 2*B*(b*c - a*d)*n*Log[
(a + b*x)/(c + d*x)]*(2*b*d*(a + b*x)*(c + d*x)*(4*A + 5*B*n + 4*B*Log[e*((
a + b*x)/(c + d*x))^n] - 4*B*n*Log[(a + b*x)/(c + d*x)]) - b*(b*c - a*d)*(c
 + d*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*n*Log[(a + b*
x)/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))
^n] - B*n*Log[(a + b*x)/(c + d*x)])) + 4*d^2*(b*c - a*d)*(a + b*x)^2*(A^2 -
 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-A + B
*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log
[e*((a + b*x)/(c + d*x))^n]*(-A + B*n + B*n*Log[(a + b*x)/(c + d*x)])) - 6*
b*d^2*(a + b*x)^2*(c + d*x)*(2*A^2 + 2*A*B*n + 5*B^2*n^2 + 2*B^2*Log[e*((a
+ b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2
*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A +
 B*n - 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/(4*(b*c - a*d)^4*g^3*
i^2*(a + b*x)^2*(c + d*x))
```

Maple [F] time = 0.74, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 2.96365, size = 5667, normalized size = 10.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] 1/2*B^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*
a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*
g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3
- 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2
*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d +
3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*
a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d
^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d
^3 + a^4*d^4)*g^3*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 + A*B*((6*
b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/
((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3
+ (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^
4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b
*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*
d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d
+ 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x +
 c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4
)*g^3*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/4*((b^3*c^3 - 24*a*b
^2*c^2*d + 15*a^2*b*c*d^2 + 8*a^3*d^3 - 4*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3
*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^3 +
 4*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*
d^2 + a^2*b*d^3)*x)*log(d*x + c)^3 - 30*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^
3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 +
a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 +
2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c
*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b
*x + a))*log(d*x + c)^2 - 3*(7*b^3*c^2*d + 6*a*b^2*c*d^2 - 13*a^2*b*d^3)*x
- 30*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*
c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(5*b^3*d^3*x^3 + 5*a^2*b*c*d^2 + 5*(
b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 +
2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 5*(2*a*b
^2*c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b
^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*n^
2/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 + 6*a^4*b^2*c^3*d^2*g^3*i^
2 - 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (b^6*c^4*d*g^3*i^2 - 4*a*
b^5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4*a^3*b^3*c*d^4*g^3*i^2 +
 a^4*b^2*d^5*g^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*b^5*c^4*d*g^3*i^2 - 2*a^
2*b^4*c^3*d^2*g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 - 7*a^4*b^2*c*d^4*g^3*i^2
 + 2*a^5*b*d^5*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2 - 7*a^2*b^4*c^4*d*g^3*i^
2 + 8*a^3*b^3*c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g^3*i^2 - 2*a^5*b*c*d^4*g
^3*i^2 + a^6*d^5*g^3*i^2)*x) + 2*(b^3*c^3 - 12*a*b^2*c^2*d + 15*a^2*b*c*d^2
 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2
 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x +
 a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a
*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d - 2*a*b^2*c*d^2
- a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x
^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^3*x^3 + a^2*b*c
*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x - 2*(b
^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 +
 a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x
```

```
+ c))^n)/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 + 6*a^4*b^2*c^3*d^2
*g^3*i^2 - 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (b^6*c^4*d*g^3*i^2
 - 4*a*b^5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4*a^3*b^3*c*d^4*g^
3*i^2 + a^4*b^2*d^5*g^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*b^5*c^4*d*g^3*i^2
 - 2*a^2*b^4*c^3*d^2*g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 - 7*a^4*b^2*c*d^4*
g^3*i^2 + 2*a^5*b*d^5*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2 - 7*a^2*b^4*c^4*d
*g^3*i^2 + 8*a^3*b^3*c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g^3*i^2 - 2*a^5*b*
c*d^4*g^3*i^2 + a^6*d^5*g^3*i^2)*x))*B^2 - 1/2*(b^3*c^3 - 12*a*b^2*c^2*d +
15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3
 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3
)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d
^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d -
2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 +
2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^3
*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b
*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2
*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*A*B*n/(a^2*b^4*c^5
*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 + 6*a^4*b^2*c^3*d^2*g^3*i^2 - 4*a^5*b*c^
2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (b^6*c^4*d*g^3*i^2 - 4*a*b^5*c^3*d^2*g^
3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4*a^3*b^3*c*d^4*g^3*i^2 + a^4*b^2*d^5*g
^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*b^5*c^4*d*g^3*i^2 - 2*a^2*b^4*c^3*d^2*
g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 - 7*a^4*b^2*c*d^4*g^3*i^2 + 2*a^5*b*d^5
*g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2 - 7*a^2*b^4*c^4*d*g^3*i^2 + 8*a^3*b^3*
c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g^3*i^2 - 2*a^5*b*c*d^4*g^3*i^2 + a^6*d
^5*g^3*i^2)*x) + 1/2*A^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2
+ 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^
3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 +
 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*
d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3
*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x +
a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)
*g^3*i^2) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*
d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2))
```

Fricas [B] time = 0.716624, size = 4177, normalized size = 7.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] -1/4*(2*A^2*b^3*c^3 - 12*A^2*a*b^2*c^2*d + 6*A^2*a^2*b*c*d^2 + 4*A^2*a^3*d^
3 - 4*(B^2*b^3*d^3*n^2*x^3 + B^2*a^2*b*c*d^2*n^2 + (B^2*b^3*c*d^2 + 2*B^2*a
*b^2*d^3)*n^2*x^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*n^2*x)*log((b*x + a
)/(d*x + c))^3 + (B^2*b^3*c^3 - 24*B^2*a*b^2*c^2*d + 15*B^2*a^2*b*c*d^2 + 8
*B^2*a^3*d^3)*n^2 - 6*(2*A^2*b^3*c*d^2 - 2*A^2*a*b^2*d^3 + 5*(B^2*b^3*c*d^2
 - B^2*a*b^2*d^3)*n^2 + 2*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*n)*x^2 + 2*(B^2*b
^3*c^3 - 6*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2 + 2*B^2*a^3*d^3 - 6*(B^2*b^3
*c*d^2 - B^2*a*b^2*d^3)*x^2 - 3*(B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2 - 3*B^2*
a^2*b*d^3)*x - 6*(B^2*b^3*d^3*x^3 + B^2*a^2*b*c*d^2 + (B^2*b^3*c*d^2 + 2*B^
2*a*b^2*d^3)*x^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*x)*log((b*x + a)/(d*
x + c)))*log(e)^2 - 2*(6*A*B*a^2*b*c*d^2*n + 3*(B^2*b^3*d^3*n^2 + 2*A*B*b^3
*d^3*n)*x^3 - (B^2*b^3*c^3 - 6*B^2*a*b^2*c^2*d + 2*B^2*a^3*d^3)*n^2 + 3*(3*
B^2*b^3*c*d^2*n^2 + 2*(A*B*b^3*c*d^2 + 2*A*B*a*b^2*d^3)*n)*x^2 + 3*((B^2*b^
3*c^2*d + 4*B^2*a*b^2*c*d^2 - 2*B^2*a^2*b*d^3)*n^2 + 2*(2*A*B*a*b^2*c*d^2 +
```

```
A*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c))^2 + 2*(A*B*b^3*c^3 - 12*A*B*
a*b^2*c^2*d + 15*A*B*a^2*b*c*d^2 - 4*A*B*a^3*d^3)*n - 3*(2*A^2*b^3*c^2*d +
4*A^2*a*b^2*c*d^2 - 6*A^2*a^2*b*d^3 + (7*B^2*b^3*c^2*d + 6*B^2*a*b^2*c*d^2
- 13*B^2*a^2*b*d^3)*n^2 + 2*(3*A*B*b^3*c^2*d - 2*A*B*a*b^2*c*d^2 - A*B*a^2*
b*d^3)*n)*x + 2*(2*A*B*b^3*c^3 - 12*A*B*a*b^2*c^2*d + 6*A*B*a^2*b*c*d^2 + 4
*A*B*a^3*d^3 - 6*(2*A*B*b^3*c*d^2 - 2*A*B*a*b^2*d^3 + (B^2*b^3*c*d^2 - B^2*
a*b^2*d^3)*n)*x^2 - 6*(B^2*b^3*d^3*n*x^3 + B^2*a^2*b*c*d^2*n + (B^2*b^3*c*d
^2 + 2*B^2*a*b^2*d^3)*n*x^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*n*x)*log(
(b*x + a)/(d*x + c))^2 + (B^2*b^3*c^3 - 12*B^2*a*b^2*c^2*d + 15*B^2*a^2*b*c
*d^2 - 4*B^2*a^3*d^3)*n - 3*(2*A*B*b^3*c^2*d + 4*A*B*a*b^2*c*d^2 - 6*A*B*a^
2*b*d^3 + (3*B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2 - B^2*a^2*b*d^3)*n)*x - 2*(6
*A*B*a^2*b*c*d^2 + 3*(B^2*b^3*d^3*n + 2*A*B*b^3*d^3)*x^3 + 3*(3*B^2*b^3*c*d
^2*n + 2*A*B*b^3*c*d^2 + 4*A*B*a*b^2*d^3)*x^2 - (B^2*b^3*c^3 - 6*B^2*a*b^2*
c^2*d + 2*B^2*a^3*d^3)*n + 3*(4*A*B*a*b^2*c*d^2 + 2*A*B*a^2*b*d^3 + (B^2*b^
3*c^2*d + 4*B^2*a*b^2*c*d^2 - 2*B^2*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c
)))*log(e) - 2*(6*A^2*a^2*b*c*d^2 + 3*(5*B^2*b^3*d^3*n^2 + 2*A*B*b^3*d^3*n
+ 2*A^2*b^3*d^3)*x^3 - (B^2*b^3*c^3 - 12*B^2*a*b^2*c^2*d - 4*B^2*a^3*d^3)*n
^2 + 3*(6*A*B*b^3*c*d^2*n + 2*A^2*b^3*c*d^2 + 4*A^2*a*b^2*d^3 + (7*B^2*b^3*
c*d^2 + 8*B^2*a*b^2*d^3)*n^2)*x^2 - 2*(A*B*b^3*c^3 - 6*A*B*a*b^2*c^2*d + 2*
A*B*a^3*d^3)*n + 3*(4*A^2*a*b^2*c*d^2 + 2*A^2*a^2*b*d^3 + (3*B^2*b^3*c^2*d
+ 8*B^2*a*b^2*c*d^2 + 4*B^2*a^2*b*d^3)*n^2 + 2*(A*B*b^3*c^2*d + 4*A*B*a*b^2
*c*d^2 - 2*A*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^6*c^4*d - 4*a
*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a^4*b^2*d^5)*g^3*i^2*x
^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^3*b^3*c^2*d^3 - 7*a
^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*i^2*x^2 + (2*a*b^5*c^5 - 7*a^2*b^4*c^4*d +
8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*d^5)*g^3*i^2*x
+ (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c^2*d^3 + a^
6*c*d^4)*g^3*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{\left(bgx+ag\right)^3(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^3*(d*i*x
+ c*i)^2), x)
```

3.201 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^2}\,dx$

Optimal. Leaf size=729

$$-\frac{6b^2d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^4i^2(a+bx)(bc-ad)^5}-\frac{12b^2Bd^2n(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5}-\frac{b^4(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{3g^4i^2(a+bx)^3(bc-ad)}$$

```
[Out] (-2*A*B*d^4*n*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) + (2*B^2*d^4*n^2
*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B^2*d^2*n^2*(c + d*
x))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B^2*d*n^2*(c + d*x)^2)/((b*c -
 a*d)^5*g^4*i^2*(a + b*x)^2) - (2*b^4*B^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)^
5*g^4*i^2*(a + b*x)^3) - (2*B^2*d^4*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))
^n])/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B*d^2*n*(c + d*x)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*
B*d*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^
4*i^2*(a + b*x)^2) - (2*b^4*B*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(9*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3) + (d^4*(a + b*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (6*b^2*d
^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i
^2*(a + b*x)) + (2*b^3*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (b^4*(c + d*x)^3*(A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3) - (4*b*d^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^5*g^4*i^2*n)
```

Rubi [C] time = 9.29131, antiderivative size = 2368, normalized size of antiderivative = 3.25, number of steps used = 167, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i + d*i*x)
^2),x]
```

```
[Out] (-2*b*B^2*n^2)/(27*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (7*b*B^2*d*n^2)/(9*
(b*c - a*d)^3*g^4*i^2*(a + b*x)^2) - (92*b*B^2*d^2*n^2)/(9*(b*c - a*d)^4*g^
4*i^2*(a + b*x)) - (2*B^2*d^3*n^2)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (110
*b*B^2*d^3*n^2*Log[a + b*x])/(9*(b*c - a*d)^5*g^4*i^2) + (4*A*b*B*d^3*n*Log
[a + b*x]^2)/((b*c - a*d)^5*g^4*i^2) + (10*b*B^2*d^3*n^2*Log[a + b*x]^2)/(3
*(b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Lo
g[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[
a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^5*g^4*i^2) - (2*b*B
*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^2*g^4*i^2*(a + b*
x)^3) + (4*b*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3
*g^4*i^2*(a + b*x)^2) - (26*b*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
))/(3*(b*c - a*d)^4*g^4*i^2*(a + b*x)) + (2*B*d^3*n*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (20*b*B*d^3*n*Log[a +
b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^5*g^4*i^2) - (b
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^2*g^4*i^2*(a + b*
x)^3) + (b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^4*i
```

```
^2*(a + b*x)^2) - (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c
- a*d)^4*g^4*i^2*(a + b*x)) - (d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (4*b*d^3*Log[a + b*x]*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i^2) + (110*b*B^2*d^3*n^2*Log
[c + d*x])/(9*(b*c - a*d)^5*g^4*i^2) - (8*A*b*B*d^3*n*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) - (20*b*B^2*d^3*n^2*Log[
-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*(b*c - a*d)^5*g^4*i^2) - (4*
b*B^2*d^3*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) + (20*b*
B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*(b*c - a*d)
^5*g^4*i^2) + (4*b*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x
])/((b*c - a*d)^5*g^4*i^2) + (4*A*b*B*d^3*n*Log[c + d*x]^2)/((b*c - a*d)^5*
g^4*i^2) + (10*b*B^2*d^3*n^2*Log[c + d*x]^2)/(3*(b*c - a*d)^5*g^4*i^2) - (4
*b*B^2*d^3*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^5*g^4*i^2) + (4*b*
B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^5*g^4
*i^2) + (4*b*B^2*d^3*n^2*Log[c + d*x]^3)/(3*(b*c - a*d)^5*g^4*i^2) - (8*A*b
*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^
2) - (20*b*B^2*d^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*(b*c
 - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c
 - a*d)])/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*n*Log[a + b*x]*Log[c + d*x
]*Log[(c + d*x)^(-n)])/((b*c - a*d)^5*g^4*i^2) - (4*b*B^2*d^3*Log[a + b*x]*
Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[-((d*(a +
 b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^5*g^4*i^2) + (8*b*
B^2*d^3*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n]
- Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^5*g^4
*i^2) - (8*A*b*B*d^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*
d)^5*g^4*i^2) - (20*b*B^2*d^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])
/(3*(b*c - a*d)^5*g^4*i^2) + (8*b*B^2*d^3*n*Log[(a + b*x)^n]*PolyLog[2, -((
d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (8*A*b*B*d^3*n*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) - (20*b*B^2*d^3*n^
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*(b*c - a*d)^5*g^4*i^2) - (8*b*B
^2*d^3*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c -
 a*d)^5*g^4*i^2) + (8*b*B^2*d^3*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c +
 d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b
*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLo
g[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3
*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (8
*b*B^2*d^3*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^
2) - (8*b*B^2*d^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*
d)^5*g^4*i^2)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
```

```
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(201c+201dx)^2(ag+bgx)^4}\,dx = -\frac{2bB^2n^2}{1090827(bc-ad)^2g^4(a+bx)^3}+\frac{7bB^2dn^2}{363609(bc-ad)^3g^4(a+bx)^2}-\frac{92bB^2d^2}{363609(bc-ad)^4}$$

Mathematica [B] time = 3.06998, size = 1695, normalized size = 2.33

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)^2),x]
```

```
[Out] -(36*b*B^2*d^3*n^2*(a + b*x)^3*(c + d*x)*Log[(a + b*x)/(c + d*x)]^3 + 9*B*n
*Log[(a + b*x)/(c + d*x)]^2*(12*a^3*A*b*c*d^3 + b^4*B*c^4*n - 6*a*b^3*B*c^3
*d*n + 18*a^2*b^2*B*c^2*d^2*n - 3*a^4*B*d^4*n + 36*a^2*A*b^2*c*d^3*x + 12*a
^3*A*b*d^4*x - 2*b^4*B*c^3*d*n*x + 18*a*b^3*B*c^2*d^2*n*x + 36*a^2*b^2*B*c*
d^3*n*x - 12*a^3*b*B*d^4*n*x + 36*a*A*b^3*c*d^3*x^2 + 36*a^2*A*b^2*d^4*x^2
+ 6*b^4*B*c^2*d^2*n*x^2 + 54*a*b^3*B*c*d^3*n*x^2 + 12*A*b^4*c*d^3*x^3 + 36*
a*A*b^3*d^4*x^3 + 22*b^4*B*c*d^3*n*x^3 + 18*a*b^3*B*d^4*n*x^3 + 12*A*b^4*d^
4*x^4 + 10*b^4*B*d^4*n*x^4 + 12*b*B*d^3*(a + b*x)^3*(c + d*x)*Log[e*((a + b
*x)/(c + d*x))^n] - 12*b*B*d^3*n*(a + b*x)^3*(c + d*x)*Log[(a + b*x)/(c + d
```

```
*x)]) + 3*b*d^2*(b*c - a*d)*(a + b*x)^2*(c + d*x)*(27*A^2 + 78*A*B*n + 92*B
^2*n^2 + 27*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(9*A + 13*B*n)*Log
[(a + b*x)/(c + d*x)] + 27*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*(
(a + b*x)/(c + d*x))^n]*(9*A + 13*B*n - 9*B*n*Log[(a + b*x)/(c + d*x)])) +
6*b*d^3*(a + b*x)^3*(c + d*x)*Log[a + b*x]*(18*A^2 + 30*A*B*n + 55*B^2*n^2
+ 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 5*B*n)*Log[(a + b*
x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x
)/(c + d*x))^n]*(6*A + 5*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + b*(b*c -
a*d)^3*(c + d*x)*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2*Log[e*((a + b*x)/(c +
 d*x))^n]^2 - 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*Log[(a
 + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*
n*Log[(a + b*x)/(c + d*x)])) - 3*b*d*(b*c - a*d)^2*(a + b*x)*(c + d*x)*(9*A
^2 + 12*A*B*n + 7*B^2*n^2 + 9*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*
(3*A + 2*B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*Log[(a + b*x)/(c + d*x)]
^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + 2*B*n - 3*B*n*Log[(a + b*x)/
(c + d*x)])) + 6*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(3*b*d^2*(a + b*x
)^2*(c + d*x)*(9*A + 13*B*n + 9*B*Log[e*((a + b*x)/(c + d*x))^n] - 9*B*n*Lo
g[(a + b*x)/(c + d*x)]) + b*(b*c - a*d)^2*(c + d*x)*(3*A + B*n + 3*B*Log[e*
((a + b*x)/(c + d*x))^n] - 3*B*n*Log[(a + b*x)/(c + d*x)]) - 3*b*d*(b*c - a
*d)*(a + b*x)*(c + d*x)*(3*A + 2*B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n] -
 3*B*n*Log[(a + b*x)/(c + d*x)]) + 9*d^3*(a + b*x)^3*(A - B*n + B*Log[e*((a
 + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])) + 27*d^3*(b*c - a*d)
*(a + b*x)^3*(A^2 - 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n
]^2 + 2*B*n*(-A + B*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log[(a + b*x)/(c
+ d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-A + B*n + B*n*Log[(a + b*x
)/(c + d*x)])) - 6*b*d^3*(a + b*x)^3*(c + d*x)*(18*A^2 + 30*A*B*n + 55*B^2*
n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 5*B*n)*Log[(a
+ b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a +
 b*x)/(c + d*x))^n]*(6*A + 5*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c +
 d*x])/(27*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3*(c + d*x))
```

Maple [F] time = 0.7, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}\left(dix+ci\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

Maxima [B] time = 4.05585, size = 8331, normalized size = 11.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
 algorithm="maxima")
```

```
[Out] -1/3*B^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^
3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11
*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^
```

```
4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3
*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 +
 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3
*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d
 + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*
x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 +
a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*
a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) -
12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a
^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n)^2 - 2/3*A*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13
*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d -
 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5
*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^
4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2
*d^5)*g^4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*
a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5
 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4
+ a^7*d^5)*g^4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 -
 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 -
5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a
^5*d^5)*g^4*i^2) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2
*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(
e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/27*((2*b^4*c^4 - 27*a*b^3*c^3*d + 32
4*a^2*b^2*c^2*d^2 - 245*a^3*b*c*d^3 - 54*a^4*d^4 + 330*(b^4*c*d^3 - a*b^3*d
^4)*x^3 + 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3
*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x
 + a)^3 - 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3
*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x
 + c)^3 + 15*(17*b^4*c^2*d^2 + 32*a*b^3*c*d^3 - 49*a^2*b^2*d^4)*x^2 - 90*(b
^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 +
 a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 - 18*(5
*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*
c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x
^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2
*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x + c)^2 -
 (19*b^4*c^3*d - 567*a*b^3*c^2*d^2 + 87*a^2*b^2*c*d^3 + 461*a^3*b*d^4)*x +
330*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c
*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a) - 6
*(55*b^4*d^4*x^4 + 55*a^3*b*c*d^3 + 55*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 165*
(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^
3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3
 + a^3*b*d^4)*x)*log(b*x + a)^2 + 55*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 30*(
b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3
+ a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a))*log(d*x
 + c))*n^2/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*
d^2*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*
d^5*g^4*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3
*d^3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b
^3*d^6*g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*
c^4*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 +
 14*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i
^2 - 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^
4*g^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c
^6*g^4*i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5
*b^3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 -
a^8*d^6*g^4*i^2)*x) + 6*(b^4*c^4 - 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*
a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^
2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (
```

```
b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b
^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (
b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b
^2*c*d^3 + a^3*b*d^4)*x)*log(d*x + c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 +
 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)*x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*
c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c
*d^3 + a^3*b*d^4)*x)*log(b*x + a) - 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b
^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2
*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a
*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*
b*d^4)*x)*log(b*x + a))*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n)/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*d^2*g^4
*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*d^5*g^4
*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3*d^3*g^
4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b^3*d^6*
g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*c^4*d^2
*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 + 14*a^5
*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i^2 - 4*
a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g^4*i
^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^6*g^4*
i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*b^3*c^
3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a^8*d^6
*g^4*i^2)*x))*B^2 - 2/9*(b^4*c^4 - 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*
a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^
2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (
b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b
^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (
b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b
^2*c*d^3 + a^3*b*d^4)*x)*log(d*x + c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 +
 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)*x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*
c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c
*d^3 + a^3*b*d^4)*x)*log(b*x + a) - 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b
^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2
*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a
*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*
b*d^4)*x)*log(b*x + a))*log(d*x + c))*A*B*n/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^
4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*d^2*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 +
 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*d^5*g^4*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7
*c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3*d^3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2
+ 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b^3*d^6*g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2
*a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*c^4*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i
^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 + 14*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*
g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i^2 - 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c
^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*
b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^6*g^4*i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25
*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*b^3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g
^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a^8*d^6*g^4*i^2)*x) - 1/3*A^2*((12*b^3*d^3
*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2
+ 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*
c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5
)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2
*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2
*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*
b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2
 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x + (a^3*b^4*c^5 - 4*
a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) +
 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*
a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12*b*d^3*log(d*x + c)
/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^
```

```
4*b*c*d^4 - a^5*d^5)*g^4*i^2))
```

Fricas [B] time = 0.830073, size = 6518, normalized size = 8.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
 algorithm="fricas")
```

```
[Out] -1/27*(9*A^2*b^4*c^4 - 54*A^2*a*b^3*c^3*d + 162*A^2*a^2*b^2*c^2*d^2 - 90*A^
2*a^3*b*c*d^3 - 27*A^2*a^4*d^4 + 6*(18*A^2*b^4*c*d^3 - 18*A^2*a*b^3*d^4 + 5
5*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n^2 + 30*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*
n)*x^3 + 36*(B^2*b^4*d^4*n^2*x^4 + B^2*a^3*b*c*d^3*n^2 + (B^2*b^4*c*d^3 + 3
*B^2*a*b^3*d^4)*n^2*x^3 + 3*(B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n^2*x^2 + (
3*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n^2*x)*log((b*x + a)/(d*x + c))^3 + (2
*B^2*b^4*c^4 - 27*B^2*a*b^3*c^3*d + 324*B^2*a^2*b^2*c^2*d^2 - 245*B^2*a^3*b
*c*d^3 - 54*B^2*a^4*d^4)*n^2 + 3*(18*A^2*b^4*c^2*d^2 + 72*A^2*a*b^3*c*d^3 -
 90*A^2*a^2*b^2*d^4 + 5*(17*B^2*b^4*c^2*d^2 + 32*B^2*a*b^3*c*d^3 - 49*B^2*a
^2*b^2*d^4)*n^2 + 6*(11*A*B*b^4*c^2*d^2 + 8*A*B*a*b^3*c*d^3 - 19*A*B*a^2*b^
2*d^4)*n)*x^2 + 9*(B^2*b^4*c^4 - 6*B^2*a*b^3*c^3*d + 18*B^2*a^2*b^2*c^2*d^2
 - 10*B^2*a^3*b*c*d^3 - 3*B^2*a^4*d^4 + 12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*
x^3 + 6*(B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 - 5*B^2*a^2*b^2*d^4)*x^2 - 2*(
B^2*b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 3*B^2*a^2*b^2*c*d^3 + 11*B^2*a^3*b*d^
4)*x + 12*(B^2*b^4*d^4*x^4 + B^2*a^3*b*c*d^3 + (B^2*b^4*c*d^3 + 3*B^2*a*b^3
*d^4)*x^3 + 3*(B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*x^2 + (3*B^2*a^2*b^2*c*d^
3 + B^2*a^3*b*d^4)*x)*log((b*x + a)/(d*x + c)))*log(e)^2 + 9*(12*A*B*a^3*b*
c*d^3*n + 2*(5*B^2*b^4*d^4*n^2 + 6*A*B*b^4*d^4*n)*x^4 + 2*((11*B^2*b^4*c*d^
3 + 9*B^2*a*b^3*d^4)*n^2 + 6*(A*B*b^4*c*d^3 + 3*A*B*a*b^3*d^4)*n)*x^3 + (B^
2*b^4*c^4 - 6*B^2*a*b^3*c^3*d + 18*B^2*a^2*b^2*c^2*d^2 - 3*B^2*a^4*d^4)*n^2
 + 6*((B^2*b^4*c^2*d^2 + 9*B^2*a*b^3*c*d^3)*n^2 + 6*(A*B*a*b^3*c*d^3 + A*B*
a^2*b^2*d^4)*n)*x^2 - 2*((B^2*b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 18*B^2*a^2*
b^2*c*d^3 + 6*B^2*a^3*b*d^4)*n^2 - 6*(3*A*B*a^2*b^2*c*d^3 + A*B*a^3*b*d^4)*
n)*x)*log((b*x + a)/(d*x + c))^2 + 6*(A*B*b^4*c^4 - 9*A*B*a*b^3*c^3*d + 54*
A*B*a^2*b^2*c^2*d^2 - 55*A*B*a^3*b*c*d^3 + 9*A*B*a^4*d^4)*n - (18*A^2*b^4*c
^3*d - 162*A^2*a*b^3*c^2*d^2 - 54*A^2*a^2*b^2*c*d^3 + 198*A^2*a^3*b*d^4 + (
19*B^2*b^4*c^3*d - 567*B^2*a*b^3*c^2*d^2 + 87*B^2*a^2*b^2*c*d^3 + 461*B^2*a
^3*b*d^4)*n^2 + 6*(5*A*B*b^4*c^3*d - 81*A*B*a*b^3*c^2*d^2 + 57*A*B*a^2*b^2*
c*d^3 + 19*A*B*a^3*b*d^4)*n)*x + 6*(3*A*B*b^4*c^4 - 18*A*B*a*b^3*c^3*d + 54
*A*B*a^2*b^2*c^2*d^2 - 30*A*B*a^3*b*c*d^3 - 9*A*B*a^4*d^4 + 6*(6*A*B*b^4*c*
d^3 - 6*A*B*a*b^3*d^4 + 5*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n)*x^3 + 3*(6*A*B
*b^4*c^2*d^2 + 24*A*B*a*b^3*c*d^3 - 30*A*B*a^2*b^2*d^4 + (11*B^2*b^4*c^2*d^
2 + 8*B^2*a*b^3*c*d^3 - 19*B^2*a^2*b^2*d^4)*n)*x^2 + 18*(B^2*b^4*d^4*n*x^4
+ B^2*a^3*b*c*d^3*n + (B^2*b^4*c*d^3 + 3*B^2*a*b^3*d^4)*n*x^3 + 3*(B^2*a*b^
3*c*d^3 + B^2*a^2*b^2*d^4)*n*x^2 + (3*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n*
x)*log((b*x + a)/(d*x + c))^2 + (B^2*b^4*c^4 - 9*B^2*a*b^3*c^3*d + 54*B^2*a
^2*b^2*c^2*d^2 - 55*B^2*a^3*b*c*d^3 + 9*B^2*a^4*d^4)*n - (6*A*B*b^4*c^3*d -
 54*A*B*a*b^3*c^2*d^2 - 18*A*B*a^2*b^2*c*d^3 + 66*A*B*a^3*b*d^4 + (5*B^2*b^
4*c^3*d - 81*B^2*a*b^3*c^2*d^2 + 57*B^2*a^2*b^2*c*d^3 + 19*B^2*a^3*b*d^4)*n
)*x + 3*(12*A*B*a^3*b*c*d^3 + 2*(5*B^2*b^4*d^4*n + 6*A*B*b^4*d^4)*x^4 + 2*(
6*A*B*b^4*c*d^3 + 18*A*B*a*b^3*d^4 + (11*B^2*b^4*c*d^3 + 9*B^2*a*b^3*d^4)*n
)*x^3 + 6*(6*A*B*a*b^3*c*d^3 + 6*A*B*a^2*b^2*d^4 + (B^2*b^4*c^2*d^2 + 9*B^2
*a*b^3*c*d^3)*n)*x^2 + (B^2*b^4*c^4 - 6*B^2*a*b^3*c^3*d + 18*B^2*a^2*b^2*c^
2*d^2 - 3*B^2*a^4*d^4)*n + 2*(18*A*B*a^2*b^2*c*d^3 + 6*A*B*a^3*b*d^4 - (B^2
*b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 18*B^2*a^2*b^2*c*d^3 + 6*B^2*a^3*b*d^4)*
n)*x)*log((b*x + a)/(d*x + c)))*log(e) + 6*(18*A^2*a^3*b*c*d^3 + (55*B^2*b^
```

```
4*d^4*n^2 + 30*A*B*b^4*d^4*n + 18*A^2*b^4*d^4)*x^4 + (18*A^2*b^4*c*d^3 + 54
*A^2*a*b^3*d^4 + 5*(17*B^2*b^4*c*d^3 + 27*B^2*a*b^3*d^4)*n^2 + 6*(11*A*B*b^
4*c*d^3 + 9*A*B*a*b^3*d^4)*n)*x^3 + (B^2*b^4*c^4 - 9*B^2*a*b^3*c^3*d + 54*B
^2*a^2*b^2*c^2*d^2 + 9*B^2*a^4*d^4)*n^2 + 3*(18*A^2*a*b^3*c*d^3 + 18*A^2*a^
2*b^2*d^4 + (11*B^2*b^4*c^2*d^2 + 63*B^2*a*b^3*c*d^3 + 36*B^2*a^2*b^2*d^4)*
n^2 + 6*(A*B*b^4*c^2*d^2 + 9*A*B*a*b^3*c*d^3)*n)*x^2 + 3*(A*B*b^4*c^4 - 6*A
*B*a*b^3*c^3*d + 18*A*B*a^2*b^2*c^2*d^2 - 3*A*B*a^4*d^4)*n + (54*A^2*a^2*b^
2*c*d^3 + 18*A^2*a^3*b*d^4 - (5*B^2*b^4*c^3*d - 81*B^2*a*b^3*c^2*d^2 - 108*
B^2*a^2*b^2*c*d^3 - 36*B^2*a^3*b*d^4)*n^2 - 6*(A*B*b^4*c^3*d - 9*A*B*a*b^3*
c^2*d^2 - 18*A*B*a^2*b^2*c*d^3 + 6*A*B*a^3*b*d^4)*n)*x)*log((b*x + a)/(d*x
+ c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*a^3*b^5*c^2*
d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*i^2*x^4 + (b^8*c^6 - 2*a*b^7*c^5*d
 - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4 + 14*a^5*b^3
*c*d^5 - 3*a^6*b^2*d^6)*g^4*i^2*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*c^5*d + 5*a^
3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6)*g^4*i^2*x^
2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20*a^5*b^3*c^3
*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*i^2*x + (a^3*b^5*c^
6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^7*b*c^2
*d^4 - a^8*c*d^5)*g^4*i^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**2
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{\left(bgx+ag\right)^4(dix+ci)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^4*(d*i*x
+ c*i)^2), x)
```

3.202 $\int \frac{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=676

$$\frac{6b^2Bg^3n(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i^3}+\frac{2b^2B^2g^3n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3}-\frac{6b^2B^2g^3n^2(\ldots}{}$$

```
[Out] (B^2*(b*c - a*d)*g^3*n^2*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (4*A*b*B*(b
*c - a*d)*g^3*n*(a + b*x))/(d^3*i^3*(c + d*x)) + (4*b*B^2*(b*c - a*d)*g^3*n
^2*(a + b*x))/(d^3*i^3*(c + d*x)) - (4*b*B^2*(b*c - a*d)*g^3*n*(a + b*x)*Lo
g[e*((a + b*x)/(c + d*x))^n])/(d^3*i^3*(c + d*x)) - (B*(b*c - a*d)*g^3*n*(a
 + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^3*(c + d*x)^2) +
 (b^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i^3) + (
(b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^
2*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2)/(d^3*i^3*(c + d*x)) + (2*b^2*B*(b*c - a*d)*g^3*n*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^3) +
 (3*b^2*(b*c - a*d)*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c -
 a*d)/(b*(c + d*x))])/(d^4*i^3) + (2*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) + (6*b^2*B*(b*c - a*d)*g^3*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/
(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[3, (d*(a + b*x))/(b*(c +
 d*x))])/(d^4*i^3)
```

Rubi [B] time = 6.20093, antiderivative size = 2026, normalized size of antiderivative = 3., number of steps used = 117, number of rules used = 26, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.578, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^3,x]
```

```
[Out] (B^2*(b*c - a*d)^3*g^3*n^2)/(4*d^4*i^3*(c + d*x)^2) - (9*b*B^2*(b*c - a*d)^
2*g^3*n^2)/(2*d^4*i^3*(c + d*x)) - (9*b^2*B^2*(b*c - a*d)*g^3*n^2*Log[a + b
*x])/(2*d^4*i^3) - (a*b^2*B^2*g^3*n^2*Log[a + b*x]^2)/(d^3*i^3) - (5*b^2*B^
2*(b*c - a*d)*g^3*n^2*Log[a + b*x]^2)/(2*d^4*i^3) - (B*(b*c - a*d)^3*g^3*n*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^4*i^3*(c + d*x)^2) + (5*b*B*(b
*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^4*i^3*(c + d*x
)) + (2*a*b^2*B*g^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(d^3*i^3) + (5*b^2*B*(b*c - a*d)*g^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/(d^4*i^3) + (b^3*g^3*x*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(d^3*i^3) + ((b*c - a*d)^3*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(2*d^4*i^3*(c + d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])^2)/(d^4*i^3*(c + d*x)) + (9*b^2*B^2*(b*c - a*d)*g^3*n^2*L
og[c + d*x])/(2*d^4*i^3) + (6*A*b^2*B*(b*c - a*d)*g^3*n*Log[-((d*(a + b*x))
/(b*c - a*d))]*Log[c + d*x])/(d^4*i^3) + (2*b^3*B^2*c*g^3*n^2*Log[-((d*(a +
 b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*n
^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*i^3) + (3*b^2*B^2*(
b*c - a*d)*g^3*Log[(a + b*x)^n]^2*Log[c + d*x])/(d^4*i^3) - (2*b^3*B*c*g^3*
```

```
n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^4*i^3) - (5*b^2*B
*(b*c - a*d)*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^
4*i^3) - (3*b^2*(b*c - a*d)*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Lo
g[c + d*x])/(d^4*i^3) - (3*A*b^2*B*(b*c - a*d)*g^3*n*Log[c + d*x]^2)/(d^4*i
^3) - (b^3*B^2*c*g^3*n^2*Log[c + d*x]^2)/(d^4*i^3) - (5*b^2*B^2*(b*c - a*d)
*g^3*n^2*Log[c + d*x]^2)/(2*d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*n^2*Log[a
 + b*x]*Log[c + d*x]^2)/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*n*Log[e*((a
+ b*x)/(c + d*x))^n]*Log[c + d*x]^2)/(d^4*i^3) - (b^2*B^2*(b*c - a*d)*g^3*n
^2*Log[c + d*x]^3)/(d^4*i^3) + (2*a*b^2*B^2*g^3*n^2*Log[a + b*x]*Log[(b*(c
+ d*x))/(b*c - a*d)])/(d^3*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*n^2*Log[a + b*
x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*L
og[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (6*b^2*B^2*(b
*c - a*d)*g^3*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/(d^4*i^3) +
(3*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d^4*i^3) -
(3*b^2*B^2*(b*c - a*d)*g^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^
(-n)]^2)/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] +
Log[(c + d*x)^(-n)]))/(d^4*i^3) + (2*a*b^2*B^2*g^3*n^2*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/(d^3*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[2,
 -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n*Lo
g[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) + (6*A*b
^2*B*(b*c - a*d)*g^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (
2*b^3*B^2*c*g^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (5*b
^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3)
 + (6*b^2*B^2*(b*c - a*d)*g^3*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x)
)/(b*c - a*d)])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n*(Log[(a + b*x)^n]
- Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[3, -
((d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*n^2*Po
lyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^3 \Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{(202c+202dx)^3}\,dx = \int \Bigg(\frac{b^3g^3\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{8242408d^3} + \frac{(-bc+ad)^3g^3\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)}{8242408d^3(c+dx)^3}$$

$$= \frac{\big(b^3g^3\big)\int \Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2\,dx}{8242408d^3} - \frac{\big(3b^2(bc-ad)g^3\big)\int \frac{\big(A+B\log\big(e\big(\frac{a+}{c+}}{c+dx}}{8242408d^3}$$

$$= \frac{b^3g^3x\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{16484816d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{16484816d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{16484816d^4(c+dx)^2}$$

$$= \frac{b^3g^3x\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{8242408d^3} + \frac{(bc-ad)^3g^3\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)^2}{16484816d^4(c+dx)^2}$$

$$= -\frac{B(bc-ad)^3g^3n\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)}{16484816d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n\Big(A+B\,\mathrm{lo}}{8242408d^4(c+}$$

$$= -\frac{B(bc-ad)^3g^3n\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)}{16484816d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n\Big(A+B\,\mathrm{lo}}{8242408d^4(c+}$$

$$= -\frac{B(bc-ad)^3g^3n\Big(A+B\log\Big(e\Big(\frac{a+bx}{c+dx}\Big)^n\Big)\Big)}{16484816d^4(c+dx)^2} + \frac{5bB(bc-ad)^2g^3n\Big(A+B\,\mathrm{lo}}{8242408d^4(c+}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3n^2\log(}{16484816d^4}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3n^2\log(}{16484816d^4}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3n^2\log(}{16484816d^4}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3n^2\log(}{16484816d^4}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3n^2\log(}{16484816d^4}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3n^2\log(}{16484816d^4}$$

$$= \frac{B^2(bc-ad)^3g^3n^2}{32969632d^4(c+dx)^2} - \frac{9bB^2(bc-ad)^2g^3n^2}{16484816d^4(c+dx)} - \frac{9b^2B^2(bc-ad)g^3n^2\log(}{16484816d^4}$$

Mathematica [B] time = 9.91975, size = 5730, normalized size = 8.48

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 0.723, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^3} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] 3/2*A*B*a^2*b*g^3*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 -
a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^
3) + 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4
)*i^3) - 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2
*d^4)*i^3)) + 1/2*A*B*a^3*g^3*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)
*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b
^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x +
 c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*A^2*b^3*g^3*((6*c^2*d*
x + 5*c^3)/(d^6*i^3*x^2 + 2*c*d^5*i^3*x + c^2*d^4*i^3) - 2*x/(d^3*i^3) + 6*
c*log(d*x + c)/(d^4*i^3)) + 3/2*A^2*a*b^2*g^3*((4*c*d*x + 3*c^2)/(d^5*i^3*x
^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2*log(d*x + c)/(d^3*i^3)) - 3*(2*d*x +
c)*A*B*a^2*b*g^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4*i^3*x^2 + 2*c*
d^3*i^3*x + c^2*d^2*i^3) - 3/2*(2*d*x + c)*A^2*a^2*b*g^3/(d^4*i^3*x^2 + 2*c
*d^3*i^3*x + c^2*d^2*i^3) - A*B*a^3*g^3*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A^2*a^3*g^3/(d^3*i^3*x^
2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 1/2*(2*B^2*b^3*d^3*g^3*x^3 + 4*B^2*b^3*c*d
^2*g^3*x^2 - 2*(2*b^3*c^2*d*g^3 - 6*a*b^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B^2*
x - (5*b^3*c^3*g^3 - 9*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 + a^3*d^3*g^3)*B
^2 - 6*((b^3*c*d^2*g^3 - a*b^2*d^3*g^3)*B^2*x^2 + 2*(b^3*c^2*d*g^3 - a*b^2*
c*d^2*g^3)*B^2*x + (b^3*c^3*g^3 - a*b^2*c^2*d*g^3)*B^2)*log(d*x + c))*log((
d*x + c)^n)^2/(d^6*i^3*x^2 + 2*c*d^5*i^3*x + c^2*d^4*i^3) - integrate(-(3*B
^2*a^2*b*d^3*g^3*x*log(e)^2 + B^2*a^3*d^3*g^3*log(e)^2 + (B^2*b^3*d^3*g^3*l
```

```
og(e)^2 + 2*A*B*b^3*d^3*g^3*log(e))*x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e)^2 + 2
*A*B*a*b^2*d^3*g^3*log(e))*x^2 + (B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3
*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*log((b*x + a)^n)^2 + 2*(3*B
^2*a^2*b*d^3*g^3*x*log(e) + B^2*a^3*d^3*g^3*log(e) + (B^2*b^3*d^3*g^3*log(e
) + A*B*b^3*d^3*g^3)*x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e) + A*B*a*b^2*d^3*g^3)
*x^2)*log((b*x + a)^n) + (2*(2*b^3*c^2*d*g^3*n - 6*a*b^2*c*d^2*g^3*n + 3*(g
^3*n - g^3*log(e))*a^2*b*d^3)*B^2*x - 2*(A*B*b^3*d^3*g^3 + (g^3*n + g^3*log
(e))*B^2*b^3*d^3)*x^3 + (5*b^3*c^3*g^3*n - 9*a*b^2*c^2*d*g^3*n + 3*a^2*b*c*
d^2*g^3*n + (g^3*n - 2*g^3*log(e))*a^3*d^3)*B^2 - 2*(3*A*B*a*b^2*d^3*g^3 +
(2*b^3*c*d^2*g^3*n + 3*a*b^2*d^3*g^3*log(e))*B^2)*x^2 + 6*((b^3*c*d^2*g^3*n
 - a*b^2*d^3*g^3*n)*B^2*x^2 + 2*(b^3*c^2*d*g^3*n - a*b^2*c*d^2*g^3*n)*B^2*x
 + (b^3*c^3*g^3*n - a*b^2*c^2*d*g^3*n)*B^2)*log(d*x + c) - 2*(B^2*b^3*d^3*g
^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)
*log((b*x + a)^n))*log((d*x + c)^n))/(d^6*i^3*x^3 + 3*c*d^5*i^3*x^2 + 3*c^2
*d^4*i^3*x + c^3*d^3*i^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\Big(e}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a
^3*g^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2
*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log(e*((b*x + a)/(d*x + c))^n))
/(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x +
 c*i)^3, x)
```

3.203 $\int \frac{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=441

$$-\frac{2b^2Bg^2n\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^3}+\frac{2b^2B^2g^2n^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3}-\frac{b^2g^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\right.}{d^3i^3}$$

```
[Out] -(B^2*g^2*n^2*(a + b*x)^2)/(4*d*i^3*(c + d*x)^2) + (2*A*b*B*g^2*n*(a + b*x)
)/(d^2*i^3*(c + d*x)) - (2*b*B^2*g^2*n^2*(a + b*x))/(d^2*i^3*(c + d*x)) + (
2*b*B^2*g^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^3*(c + d*x))
 + (B*g^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i^3*(c
 + d*x)^2) - (g^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*
d*i^3*(c + d*x)^2) - (b*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(d^2*i^3*(c + d*x)) - (b^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^3) - (2*b^2*B*g^2*n*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
 + (2*b^2*B^2*g^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

Rubi [B] time = 5.12309, antiderivative size = 1435, normalized size of antiderivative = 3.25, number of steps used = 97, number of rules used = 25, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^3,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g^2*n^2)/(4*d^3*i^3*(c + d*x)^2) + (5*b*B^2*(b*c - a*d)
*g^2*n^2)/(2*d^3*i^3*(c + d*x)) + (5*b^2*B^2*g^2*n^2*Log[a + b*x])/(2*d^3*i
^3) + (3*b^2*B^2*g^2*n^2*Log[a + b*x]^2)/(2*d^3*i^3) + (B*(b*c - a*d)^2*g^2
*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^3*i^3*(c + d*x)^2) - (3*b*B
*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^3*(c + d*
x)) - (3*b^2*B*g^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
d^3*i^3) - ((b*c - a*d)^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*
d^3*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n])^2)/(d^3*i^3*(c + d*x)) - (5*b^2*B^2*g^2*n^2*Log[c + d*x])/(2*d^3*i^
3) - (2*A*b^2*B*g^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3*
i^3) - (3*b^2*B^2*g^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(
d^3*i^3) - (b^2*B^2*g^2*Log[(a + b*x)^n]^2*Log[c + d*x])/(d^3*i^3) + (3*b^2
*B*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^3*i^3) + (
b^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/(d^3*i^3) +
(A*b^2*B*g^2*n*Log[c + d*x]^2)/(d^3*i^3) + (3*b^2*B^2*g^2*n^2*Log[c + d*x]^
2)/(2*d^3*i^3) - (b^2*B^2*g^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/(d^3*i^3) +
(b^2*B^2*g^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/(d^3*i^3) + (
b^2*B^2*g^2*n^2*Log[c + d*x]^3)/(3*d^3*i^3) - (3*b^2*B^2*g^2*n^2*Log[a + b*
x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) + (b^2*B^2*g^2*Log[(a + b*x)^n
]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) - (2*b^2*B^2*g^2*n*Log[a + b*
x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/(d^3*i^3) - (b^2*B^2*g^2*Log[a + b*x]*
Log[(c + d*x)^(-n)]^2)/(d^3*i^3) + (b^2*B^2*g^2*Log[-((d*(a + b*x))/(b*c -
a*d))]*Log[(c + d*x)^(-n)]^2)/(d^3*i^3) + (2*b^2*B^2*g^2*n*Log[-((d*(a + b*
```

```
x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*
x))^n] + Log[(c + d*x)^(-n)]))/(d^3*i^3) - (3*b^2*B^2*g^2*n^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(d^3*i^3) + (2*b^2*B^2*g^2*n*Log[(a + b*x)^n]*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^3) - (2*A*b^2*B*g^2*n*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) - (3*b^2*B^2*g^2*n^2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) - (2*b^2*B^2*g^2*n*Log[(c + d*x)^(-
n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) + (2*b^2*B^2*g^2*n*(Lo
g[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) - (2*b^2*B^2*g^2*n^2*PolyLog[3
, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^3) - (2*b^2*B^2*g^2*n^2*PolyLog[3,
(b*(c + d*x))/(b*c - a*d)])/(d^3*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
```

```
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
```

```
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{(ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(203c+203dx)^3}\,dx = \int \left(\frac{(-bc+ad)^2 g^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8365427d^2(c+dx)^3} - \frac{2b(bc-ad)g^2 \left(A+B\log\left(e\left(\cdots\right.\right.\right.}{8365427d^2(c+dx)\cdots} \right.$$

$$= \frac{\left(b^2g^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{8365427d^2} - \frac{\left(2b(bc-ad)g^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2}\,dx}{8365427d^2} + \cdots$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.\right.}{8365427d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.\right.}{8365427d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.\right.}{8365427d^3(c+dx)}$$

$$= -\frac{(bc-ad)^2g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16730854d^3(c+dx)^2} + \frac{2b(bc-ad)g^2\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.\right.}{8365427d^3(c+dx)}$$

$$= \frac{B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16730854d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n\left(A+B\log\left(e\left(\cdots\right.\right.\right.}{8365427d^3(c+dx)}$$

$$= \frac{B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16730854d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n\left(A+B\log\left(e\left(\cdots\right.\right.\right.}{8365427d^3(c+dx)}$$

$$= \frac{B(bc-ad)^2g^2n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16730854d^3(c+dx)^2} - \frac{3bB(bc-ad)g^2n\left(A+B\log\left(e\left(\cdots\right.\right.\right.}{8365427d^3(c+dx)}$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\log(a+bx)}{16730854d^3} + \cdots$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\log(a+bx)}{16730854d^3} + \cdots$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\log(a+bx)}{16730854d^3} + \cdots$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\log(a+bx)}{16730854d^3} + \cdots$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\log(a+bx)}{16730854d^3} + \cdots$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\log(a+bx)}{16730854d^3} + \cdots$$

$$= -\frac{B^2(bc-ad)^2g^2n^2}{33461708d^3(c+dx)^2} + \frac{5bB^2(bc-ad)g^2n^2}{16730854d^3(c+dx)} + \frac{5b^2B^2g^2n^2\log(a+bx)}{16730854d^3} + \cdots$$

Mathematica [B] time = 8.07997, size = 3172, normalized size = 7.19

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i +
 d*i*x)^3,x]
```

```
[Out] (g^2*((-2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a
+ b*x)/(c + d*x)])^2)/(c + d*x)^2 + (8*b*(b*c - a*d)*(A + B*Log[e*((a + b*x
)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2)/(c + d*x) + 4*b^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Log[c + d
*x] + (4*a*b*B*d*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*
x)/(c + d*x)])*(-(b^2*c^3) + 4*a*b*c^2*d - 3*a^2*c*d^2 - 2*b^2*c^2*d*x + 6*
a*b*c*d^2*x - 4*a^2*d^3*x - 2*b*(b*c - 2*a*d)*(c + d*x)^2*Log[a + b*x] + 2*
(b*c - a*d)^2*(c + 2*d*x)*Log[(a + b*x)/(c + d*x)] + 2*b^2*c^3*Log[c + d*x]
 - 4*a*b*c^2*d*Log[c + d*x] + 4*b^2*c^2*d*x*Log[c + d*x] - 8*a*b*c*d^2*x*Lo
g[c + d*x] + 2*b^2*c*d^2*x^2*Log[c + d*x] - 4*a*b*d^3*x^2*Log[c + d*x]))/((
b*c - a*d)^2*(c + d*x)^2) + (2*a^2*B*d^2*n*(-A - B*Log[e*((a + b*x)/(c + d*
x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(b^2*c^2) + 4*a*b*c*d - a^2*d^2 +
2*b^2*c*d*x + 2*a*b*d^2*x + 2*b^2*d^2*x^2 - 2*b^2*(c + d*x)^2*Log[a/b + x]
+ 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)] + 2*b^2*c^2*Log[(b*(c + d*x))/(b
*c - a*d)] + 4*b^2*c*d*x*Log[(b*(c + d*x))/(b*c - a*d)] + 2*b^2*d^2*x^2*Log
[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^2*(c + d*x)^2) + 2*b^2*B*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*Log[c/
d + x]^2 - (8*c*(1 + Log[c/d + x]))/(c + d*x) + (c^2*(1 + 2*Log[c/d + x]))/
(c + d*x)^2 + 8*c*(Log[a/b + x]/(c + d*x) + (b*(Log[a + b*x] - Log[c + d*x]
))/(-(b*c) + a*d)) + 2*(-Log[a/b + x] + Log[c/d + x] + Log[(a + b*x)/(c + d
*x)])*((c*(3*c + 4*d*x))/(c + d*x)^2 + 2*Log[c + d*x]) + (2*c^2*(-Log[a/b +
 x] + (b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[
c + d*x]))/(b*c - a*d)^2))/(c + d*x)^2 + 4*(Log[a/b + x]*Log[(b*(c + d*x))/
(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) + (2*a*b*B^2*d*n^
2*(2*c*Log[(a + b*x)/(c + d*x)]^2 - 4*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2
- (4*(c + d*x)*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*
Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*
x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*L
og[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2
*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b
*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])))/(b*c - a*d) + (c*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x)
 + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(a + b*x)/(c + d*x)
] - 4*b*(b*c - a*d)*(c + d*x)*Log[(a + b*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*
Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*
b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x
]) - 4*b^2*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*
x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(
b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c + d*x
)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] +
Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
)/(b*c - a*d)^2))/(c + d*x)^2 - (a^2*B^2*d^2*n^2*((b*c - a*d)^2 + 2*b*(b*c
- a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b*c - a*d)^2*Log[(a
+ b*x)/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(a + b*x)/(c + d*x)] - 4*
b^2*(c + d*x)^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 2*(b*c - a*d)^2*Log
[(a + b*x)/(c + d*x)]^2 - 2*b^2*(c + d*x)^2*Log[c + d*x] + 4*b*(c + d*x)*(b
*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 4*b^2*(c
+ d*x)^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*b^2*(c
 + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) -
```

```
 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c + d*x)^2*(Log[(b*c
- a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d
)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)
^2*(c + d*x)^2) - 2*b^2*B^2*n^2*((c^2*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x)
^2 - (4*c*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) + 2*Log[(a + b*x)/(c + d*x)
]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 4*Log[(a + b*x)/(c + d*x)]*PolyLog[2,
(d*(a + b*x))/(b*(c + d*x))] - (4*c*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a +
b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*
Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(
a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + (c^2*((b*c -
 a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*(b
*c - a*d)^2*Log[(a + b*x)/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*Log[(a + b
*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] -
2*b^2*(c + d*x)^2*Log[c + d*x] + 4*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log
[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 4*b^2*(c + d*x)^2*Log[(a + b*x)/(c
+ d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x)^2*(Log[a + b*x]*(L
og[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x)
)/(-(b*c) + a*d)]) + 2*b^2*(c + d*x)^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])))/(2*(b*c - a*d)^2*(c + d*x)^2) - 4*Poly
Log[3, (d*(a + b*x))/(b*(c + d*x))])))/(4*d^3*i^3)
```

Maple [F] time = 0.71, size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^{2}}{\left(dix + ci\right)^{3}} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] A*B*a*b*g^2*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)
*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2
*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3)
 - 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*
i^3)) + 1/2*A*B*a^2*g^2*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x
^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log
(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((
b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 1/2*A^2*b^2*g^2*((4*c*d*x + 3*c^
```

```
2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2*log(d*x + c)/(d^3*i^3))
- 2*(2*d*x + c)*A*B*a*b*g^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4*i^3
*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (2*d*x + c)*A^2*a*b*g^2/(d^4*i^3*x^2
+ 2*c*d^3*i^3*x + c^2*d^2*i^3) - A*B*a^2*g^2*log(e*(b*x/(d*x + c) + a/(d*x
+ c))^n)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A^2*a^2*g^2/(d^3*i
^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 1/2*(4*(b^2*c*d*g^2 - a*b*d^2*g^2)*B^
2*x + (3*b^2*c^2*g^2 - 2*a*b*c*d*g^2 - a^2*d^2*g^2)*B^2 + 2*(B^2*b^2*d^2*g^
2*x^2 + 2*B^2*b^2*c*d*g^2*x + B^2*b^2*c^2*g^2)*log(d*x + c))*log((d*x + c)^
n)^2/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) - integrate(-(2*B^2*a*b*d^
2*g^2*x*log(e)^2 + B^2*a^2*d^2*g^2*log(e)^2 + (B^2*b^2*d^2*g^2*log(e)^2 + 2
*A*B*b^2*d^2*g^2*log(e))*x^2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x +
 B^2*a^2*d^2*g^2)*log((b*x + a)^n)^2 + 2*(2*B^2*a*b*d^2*g^2*x*log(e) + B^2*
a^2*d^2*g^2*log(e) + (B^2*b^2*d^2*g^2*log(e) + A*B*b^2*d^2*g^2)*x^2)*log((b
*x + a)^n) - (4*(b^2*c*d*g^2*n - (g^2*n - g^2*log(e))*a*b*d^2)*B^2*x + (3*b
^2*c^2*g^2*n - 2*a*b*c*d*g^2*n - (g^2*n - 2*g^2*log(e))*a^2*d^2)*B^2 + 2*(B
^2*b^2*d^2*g^2*log(e) + A*B*b^2*d^2*g^2)*x^2 + 2*(B^2*b^2*d^2*g^2*n*x^2 + 2
*B^2*b^2*c*d*g^2*n*x + B^2*b^2*c^2*g^2*n)*log(d*x + c) + 2*(B^2*b^2*d^2*g^2
*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log((b*x + a)^n))*log((d*x +
c)^n))/(d^5*i^3*x^3 + 3*c*d^4*i^3*x^2 + 3*c^2*d^3*i^3*x + c^3*d^2*i^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABb^2g^2x^2 + 2\,A\right.}{d^3i^3x^3 + 3\,cd^2i^3x^2 + 3\,c^2di^3x + c^3i^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^
2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*
B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^
n))/(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(dix + ci)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x +
 c*i)^3, x)
```

3.204 $\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=151

$$\frac{g(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)}-\frac{Bgn(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2i^3(c+dx)^2(bc-ad)}+\frac{B^2gn^2(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

```
[Out] (B^2*g*n^2*(a + b*x)^2)/(4*(b*c - a*d)*i^3*(c + d*x)^2) - (B*g*n*(a + b*x)^
2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*i^3*(c + d*x)^2) +
 (g*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)*i^
3*(c + d*x)^2)
```

Rubi [C] time = 1.99646, antiderivative size = 686, normalized size of antiderivative = 4.54, number of steps used = 54, number of rules used = 11, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.256, Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2B^2gn^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{d^2i^3(bc-ad)}+\frac{b^2B^2gn^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2i^3(bc-ad)}+\frac{b^2Bgn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^3(bc-ad)}-\frac{b^2Bgn}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x)^
3,x]
```

```
[Out] (B^2*(b*c - a*d)*g*n^2)/(4*d^2*i^3*(c + d*x)^2) - (b*B^2*g*n^2)/(2*d^2*i^3*
(c + d*x)) - (b^2*B^2*g*n^2*Log[a + b*x])/(2*d^2*(b*c - a*d)*i^3) - (b^2*B^
2*g*n^2*Log[a + b*x]^2)/(2*d^2*(b*c - a*d)*i^3) - (B*(b*c - a*d)*g*n*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^3*(c + d*x)^2) + (b*B*g*n*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^3*(c + d*x)) + (b^2*B*g*n*Log[a +
b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*(b*c - a*d)*i^3) + ((b*c
- a*d)*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^2*i^3*(c + d*x)^2)
- (b*g*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^3*(c + d*x)) + (b^2
*B^2*g*n^2*Log[c + d*x])/(2*d^2*(b*c - a*d)*i^3) + (b^2*B^2*g*n^2*Log[-((d*
(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*(b*c - a*d)*i^3) - (b^2*B*g*n*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^2*(b*c - a*d)*i^3) -
 (b^2*B^2*g*n^2*Log[c + d*x]^2)/(2*d^2*(b*c - a*d)*i^3) + (b^2*B^2*g*n^2*Lo
g[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*(b*c - a*d)*i^3) + (b^2*B^2
*g*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*(b*c - a*d)*i^3) + (b
^2*B^2*g*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*(b*c - a*d)*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
```

```
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(204c+204dx)^3}\,dx = \int \left(\frac{(-bc+ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8489664d(c+dx)^3} + \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8489664d(c+dx)^2}\right.$$

$$= \frac{(bg)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2}\,dx}{8489664d} - \frac{((bc-ad)g)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^3}\,dx}{8489664d}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8489664d^2(c+dx)} + \frac{(bE}{}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8489664d^2(c+dx)} + \frac{(bE}{}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8489664d^2(c+dx)} + \frac{(bE}{}$$

$$= \frac{(bc-ad)g\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{16979328d^2(c+dx)^2} - \frac{bg\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8489664d^2(c+dx)} + \frac{(bE}{}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16979328d^2(c+dx)^2} + \frac{bBgn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8489664d^2(c+dx)}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16979328d^2(c+dx)^2} + \frac{bBgn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8489664d^2(c+dx)}$$

$$= -\frac{B(bc-ad)gn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{16979328d^2(c+dx)^2} + \frac{bBgn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8489664d^2(c+dx)}$$

$$= \frac{B^2(bc-ad)gn^2}{33958656d^2(c+dx)^2} - \frac{bB^2gn^2}{16979328d^2(c+dx)} - \frac{b^2B^2gn^2\log(a+bx)}{16979328d^2(bc-ad)} -$$

$$= \frac{B^2(bc-ad)gn^2}{33958656d^2(c+dx)^2} - \frac{bB^2gn^2}{16979328d^2(c+dx)} - \frac{b^2B^2gn^2\log(a+bx)}{16979328d^2(bc-ad)} -$$

$$= \frac{B^2(bc-ad)gn^2}{33958656d^2(c+dx)^2} - \frac{bB^2gn^2}{16979328d^2(c+dx)} - \frac{b^2B^2gn^2\log(a+bx)}{16979328d^2(bc-ad)} -$$

Mathematica [C] time = 0.949506, size = 803, normalized size = 5.32

$$g\left(2(bc-ad)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - 4b(bc-ad)(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + 4bBn(c+dx)\left(2(bc-ad)\left(A\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d
*i*x)^3,x]
```

```
[Out] (g*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 4*b*(b*c - a
*d)*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 4*b*B*n*(c + d*x)*
(2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Lo
g[a + b*x] - b*(c + d*x)*Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log
[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/
(-(b*c) + a*d)]) + b*B*n*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) - B*
n*(2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)
*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d
+ b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2
 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c +
d*x)^2*Log[c + d*x]) - 2*b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] -
2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*
d)]) + 2*b^2*B*n*(c + d*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
+ d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(4*d^2*(
b*c - a*d)*i^3*(c + d*x)^2)
```

Maple [F] time = 0.527, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{(dix + ci)^3} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 1.75734, size = 2693, normalized size = 17.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*A*B*b*g*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)
*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2
*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3)
 - 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*
i^3)) + 1/2*A*B*a*g*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 +
 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x
 + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*
c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*(2*d*x + c)*B^2*b*g*log(e*(b*x/(
d*x + c) + a/(d*x + c))^n)^2/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) +
1/4*(2*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2
```

```
 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x + a)/((b^2*c
^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b
*c*d^2 + a^2*d^3)*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (7*b^2*c^2
 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x +
a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d
- a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*
b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*
c^2)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^4*d*i^3 - 2*a*b*c^3*d^2*i^3 + a
^2*c^2*d^3*i^3 + (b^2*c^2*d^3*i^3 - 2*a*b*c*d^4*i^3 + a^2*d^5*i^3)*x^2 + 2*
(b^2*c^3*d^2*i^3 - 2*a*b*c^2*d^3*i^3 + a^2*c*d^4*i^3)*x))*B^2*a*g + 1/4*(2*
n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2
*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2*(b^2*c - 2*
a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) - 2*(b^2*c
- 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3))*log(e*
(b*x/(d*x + c) + a/(d*x + c))^n) - (b^2*c^3 - 8*a*b*c^2*d + 7*a^2*c*d^2 + 2
*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 2*a*
b*c*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*
d^3)*x^2 + 2*(b^2*c^2*d - 2*a*b*c*d^2)*x)*log(d*x + c)^2 + 2*(b^2*c^2*d - 5
*a*b*c*d^2 + 4*a^2*d^3)*x + 2*(b^2*c^3 - 4*a*b*c^2*d + (b^2*c*d^2 - 4*a*b*d
^3)*x^2 + 2*(b^2*c^2*d - 4*a*b*c*d^2)*x)*log(b*x + a) - 2*(b^2*c^3 - 4*a*b*
c^2*d + (b^2*c*d^2 - 4*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 4*a*b*c*d^2)*x + 2*(b^
2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 2*a*b*c*
d^2)*x)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^4*d^2*i^3 - 2*a*b*c^3*d^3*i^
3 + a^2*c^2*d^4*i^3 + (b^2*c^2*d^4*i^3 - 2*a*b*c*d^5*i^3 + a^2*d^6*i^3)*x^2
 + 2*(b^2*c^3*d^3*i^3 - 2*a*b*c^2*d^4*i^3 + a^2*c*d^5*i^3)*x))*B^2*b*g - (2
*d*x + c)*A*B*b*g*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4*i^3*x^2 + 2*c
*d^3*i^3*x + c^2*d^2*i^3) - 1/2*B^2*a*g*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n)^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*(2*d*x + c)*A^2*b*g/(
d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - A*B*a*g*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A^2*a*g/(d
^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
```

Fricas [B] time = 0.569616, size = 1214, normalized size = 8.04

$$-\frac{\left(B^2b^2c^2 - B^2a^2d^2\right)gn^2 - 2\left(ABb^2c^2 - ABa^2d^2\right)gn + 2\left(2\left(B^2b^2cd - B^2abd^2\right)gx + \left(B^2b^2c^2 - B^2a^2d^2\right)g\right)\log(e)^2 - 2\left(B^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] -1/4*((B^2*b^2*c^2 - B^2*a^2*d^2)*g*n^2 - 2*(A*B*b^2*c^2 - A*B*a^2*d^2)*g*n
 + 2*(2*(B^2*b^2*c*d - B^2*a*b*d^2)*g*x + (B^2*b^2*c^2 - B^2*a^2*d^2)*g)*lo
g(e)^2 - 2*(B^2*b^2*d^2*g*n^2*x^2 + 2*B^2*a*b*d^2*g*n^2*x + B^2*a^2*d^2*g*n
^2)*log((b*x + a)/(d*x + c))^2 + 2*(A^2*b^2*c^2 - A^2*a^2*d^2)*g + 2*((B^2*
b^2*c*d - B^2*a*b*d^2)*g*n^2 - 2*(A*B*b^2*c*d - A*B*a*b*d^2)*g*n + 2*(A^2*b
^2*c*d - A^2*a*b*d^2)*g)*x - 2*((B^2*b^2*c^2 - B^2*a^2*d^2)*g*n - 2*(A*B*b^
2*c^2 - A*B*a^2*d^2)*g + 2*((B^2*b^2*c*d - B^2*a*b*d^2)*g*n - 2*(A*B*b^2*c*
d - A*B*a*b*d^2)*g)*x + 2*(B^2*b^2*d^2*g*n*x^2 + 2*B^2*a*b*d^2*g*n*x + B^2*
a^2*d^2*g*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*(B^2*a^2*d^2*g*n^2 - 2*A*
B*a^2*d^2*g*n + (B^2*b^2*d^2*g*n^2 - 2*A*B*b^2*d^2*g*n)*x^2 + 2*(B^2*a*b*d^
2*g*n^2 - 2*A*B*a*b*d^2*g*n)*x)*log((b*x + a)/(d*x + c)))/((b*c*d^4 - a*d^5
)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c
*i)^3, x)
```

3.205 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dix)^3}\,dx$

Optimal. Leaf size=317

$$\frac{Bdn(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2i^3(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^3(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)^2}-\ldots$$

```
[Out] -(B^2*d*n^2*(a + b*x)^2)/(4*(b*c - a*d)^2*i^3*(c + d*x)^2) - (2*A*b*B*n*(a
+ b*x))/((b*c - a*d)^2*i^3*(c + d*x)) + (2*b*B^2*n^2*(a + b*x))/((b*c - a*d
)^2*i^3*(c + d*x)) - (2*b*B^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(
(b*c - a*d)^2*i^3*(c + d*x)) + (B*d*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(2*(b*c - a*d)^2*i^3*(c + d*x)^2) - (d*(a + b*x)^2*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^2*i^3*(c + d*x)^2) + (b*(a
+ b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*i^3*(c + d*
x))
```

Rubi [C] time = 0.879406, antiderivative size = 626, normalized size of antiderivative = 1.97, number of steps used = 28, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2B^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{di^3(bc-ad)^2}+\frac{b^2B^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{di^3(bc-ad)^2}+\frac{b^2Bn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{di^3(bc-ad)^2}-\frac{b^2Bn\log(\ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^3,x]
```

```
[Out] -(B^2*n^2)/(4*d*i^3*(c + d*x)^2) - (3*b*B^2*n^2)/(2*d*(b*c - a*d)*i^3*(c +
d*x)) - (3*b^2*B^2*n^2*Log[a + b*x])/(2*d*(b*c - a*d)^2*i^3) - (b^2*B^2*n^2
*Log[a + b*x]^2)/(2*d*(b*c - a*d)^2*i^3) + (B*n*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(2*d*i^3*(c + d*x)^2) + (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(d*(b*c - a*d)*i^3*(c + d*x)) + (b^2*B*n*Log[a + b*x]*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(d*(b*c - a*d)^2*i^3) - (A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2/(2*d*i^3*(c + d*x)^2) + (3*b^2*B^2*n^2*Log[c + d*x])/(2*d
*(b*c - a*d)^2*i^3) + (b^2*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/(d*(b*c - a*d)^2*i^3) - (b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[c + d*x])/(d*(b*c - a*d)^2*i^3) - (b^2*B^2*n^2*Log[c + d*x]^2)/(2*
d*(b*c - a*d)^2*i^3) + (b^2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(d*(b*c - a*d)^2*i^3) + (b^2*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c
- a*d))])/(d*(b*c - a*d)^2*i^3) + (b^2*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/(d*(b*c - a*d)^2*i^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(205c+205dx)^3}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} + \frac{(Bn)\int\frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{42025(a+bx)(c+dx)^3}\,dx}{205d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} + \frac{(B(bc-ad)n)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^3}\,dx}{8615125d}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} + \frac{(B(bc-ad)n)\int\left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{(bc-ad)(c+dx)^3}\right.}{86151}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c+dx)^2} - \frac{(Bn)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^3}\,dx}{8615125} - \frac{\left(b^2Bn\right)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{c+dx}}{8615125(bc-ad)^2}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc-ad)(c+dx)} + \frac{b^2Bn\log(a+bx)\left(A\right.}{8615125d(}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc-ad)(c+dx)} + \frac{b^2Bn\log(a+bx)\left(A\right.}{8615125d(}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc-ad)(c+dx)} + \frac{b^2Bn\log(a+bx)\left(A\right.}{8615125d(}$$

$$= -\frac{B^2n^2}{34460500d(c+dx)^2} - \frac{3bB^2n^2}{17230250d(bc-ad)(c+dx)} - \frac{3b^2B^2n^2\log(a+bx)}{17230250d(bc-ad)^2} + \frac{Bn}{}$$

$$= -\frac{B^2n^2}{34460500d(c+dx)^2} - \frac{3bB^2n^2}{17230250d(bc-ad)(c+dx)} - \frac{3b^2B^2n^2\log(a+bx)}{17230250d(bc-ad)^2} - \frac{b^2}{172}$$

$$= -\frac{B^2n^2}{34460500d(c+dx)^2} - \frac{3bB^2n^2}{17230250d(bc-ad)(c+dx)} - \frac{3b^2B^2n^2\log(a+bx)}{17230250d(bc-ad)^2} - \frac{b^2}{172}$$

Mathematica [C] time = 0.454628, size = 464, normalized size = 1.46

$$\frac{Bn\left(-2b^2Bn(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2Bn(c+dx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[e*((a
```

```
+ b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x
] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d
*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*
b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
- a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*n*(c + d*x
)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^
2)
```

Maple [F] time = 0.512, size = 0, normalized size = 0.

$$\int \frac{1}{(dix+ci)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 1.39228, size = 1162, normalized size = 3.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, algorithm="ma
xima")
```

```
[Out] 1/2*A*B*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^
2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x + a)/((b^2*
c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*
b*c*d^2 + a^2*d^3)*i^3)) + 1/4*(2*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*
d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) +
 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d
*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3))*log(e*(b*x/(d*x + c) + a
/(d*x + c))^n) - (7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*
c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*l
og(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^
2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d
^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^4*d*
i^3 - 2*a*b*c^3*d^2*i^3 + a^2*c^2*d^3*i^3 + (b^2*c^2*d^3*i^3 - 2*a*b*c*d^4*
i^3 + a^2*d^5*i^3)*x^2 + 2*(b^2*c^3*d^2*i^3 - 2*a*b*c^2*d^3*i^3 + a^2*c*d^4
*i^3)*x))*B^2 - 1/2*B^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(d^3*i^3*x
^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A^2/(d^3*i^3*x^2 + 2*c*d^
2*i^3*x + c^2*d*i^3)
```

Fricas [B] time = 0.573039, size = 1354, normalized size = 4.27

$$-\frac{2\,A^{2}b^{2}c^{2}-4\,A^{2}abcd+2\,A^{2}a^{2}d^{2}+\left(7\,B^{2}b^{2}c^{2}-8\,B^{2}abcd+B^{2}a^{2}d^{2}\right)n^{2}+2\left(B^{2}b^{2}c^{2}-2\,B^{2}abcd+B^{2}a^{2}d^{2}\right)\log\left(e\right)^{2}-2\left(B^{2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, algorithm="fr
icas")
```

```
[Out] -1/4*(2*A^2*b^2*c^2 - 4*A^2*a*b*c*d + 2*A^2*a^2*d^2 + (7*B^2*b^2*c^2 - 8*B^
2*a*b*c*d + B^2*a^2*d^2)*n^2 + 2*(B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2
)*log(e)^2 - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^2*b^2*c*d*n^2*x + (2*B^2*a*b*c*d
- B^2*a^2*d^2)*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(3*A*B*b^2*c^2 - 4*A*B*a
*b*c*d + A*B*a^2*d^2)*n + 2*(3*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2 - 2*(A*B*b^2
*c*d - A*B*a*b*d^2)*n)*x + 2*(2*A*B*b^2*c^2 - 4*A*B*a*b*c*d + 2*A*B*a^2*d^2
 - 2*(B^2*b^2*c*d - B^2*a*b*d^2)*n*x - (3*B^2*b^2*c^2 - 4*B^2*a*b*c*d + B^2
*a^2*d^2)*n - 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*b^2*c*d*n*x + (2*B^2*a*b*c*d - B
^2*a^2*d^2)*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*((4*B^2*a*b*c*d - B^2*a
^2*d^2)*n^2 + (3*B^2*b^2*d^2*n^2 - 2*A*B*b^2*d^2*n)*x^2 - 2*(2*A*B*a*b*c*d
- A*B*a^2*d^2)*n - 2*(2*A*B*b^2*c*d*n - (2*B^2*b^2*c*d + B^2*a*b*d^2)*n^2)*
x)*log((b*x + a)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*i^3*x^2
 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*i^3*x + (b^2*c^4*d - 2*a*b*c
^3*d^2 + a^2*c^2*d^3)*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(dix + ci)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i)^3, x)
```

3.206 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^3}\,dx$

Optimal. Leaf size=402

$$\frac{b^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{3Bgi^3n(bc-ad)^3}+\frac{d^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{Bd^2n(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2gi^3(c+dx)^2(bc-ad)^3}-\frac{2bd(a+\cdots}{\cdots}$$

```
[Out] (B^2*d^2*n^2*(a + b*x)^2)/(4*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (4*A*b*B*d*
n*(a + b*x))/((b*c - a*d)^3*g*i^3*(c + d*x)) - (4*b*B^2*d*n^2*(a + b*x))/((
b*c - a*d)^3*g*i^3*(c + d*x)) + (4*b*B^2*d*n*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n])/((b*c - a*d)^3*g*i^3*(c + d*x)) - (B*d^2*n*(a + b*x)^2*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) + (d^2*
(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g*i^
3*(c + d*x)^2) - (2*b*d*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)
/((b*c - a*d)^3*g*i^3*(c + d*x)) + (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^3)/(3*B*(b*c - a*d)^3*g*i^3*n)
```

Rubi [C] time = 7.04324, antiderivative size = 2025, normalized size of antiderivative = 5.04, number of steps used = 111, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*i*x)^3
),x]
```

```
[Out] (B^2*n^2)/(4*(b*c - a*d)*g*i^3*(c + d*x)^2) + (7*b*B^2*n^2)/(2*(b*c - a*d)^
2*g*i^3*(c + d*x)) + (7*b^2*B^2*n^2*Log[a + b*x])/(2*(b*c - a*d)^3*g*i^3) -
 (A*b^2*B*n*Log[a + b*x]^2)/((b*c - a*d)^3*g*i^3) + (3*b^2*B^2*n^2*Log[a +
b*x]^2)/(2*(b*c - a*d)^3*g*i^3) - (b^2*B^2*Log[-((b*c - a*d)/(d*(a + b*x)))
]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^3*g*i^3) - (b^2*B^2*Log[a
+ b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^3*g*i^3) - (B*n*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) - (3*b
*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g*i^3*(c + d*x)
) - (3*b^2*B*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c -
 a*d)^3*g*i^3) + (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*(b*c - a*d)*g*
i^3*(c + d*x)^2) + (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d
)^2*g*i^3*(c + d*x)) + (b^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])^2)/((b*c - a*d)^3*g*i^3) - (7*b^2*B^2*n^2*Log[c + d*x])/(2*(b*c - a*d)
^3*g*i^3) + (2*A*b^2*B*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((
b*c - a*d)^3*g*i^3) - (3*b^2*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
c + d*x])/((b*c - a*d)^3*g*i^3) + (b^2*B^2*Log[(a + b*x)^n]^2*Log[c + d*x])
/((b*c - a*d)^3*g*i^3) + (3*b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*
Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (A*b^2*B*n*Log[c + d*x]^2)/(
(b*c - a*d)^3*g*i^3) + (3*b^2*B^2*n^2*Log[c + d*x]^2)/(2*(b*c - a*d)^3*g*i^
3) + (b^2*B^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^3*g*i^3) - (b^2
*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^3*g*i^3)
 - (b^2*B^2*n^2*Log[c + d*x]^3)/(3*(b*c - a*d)^3*g*i^3) + (2*A*b^2*B*n*Log[
```

```
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2
*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (
b^2*B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g
*i^3) + (2*b^2*B^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c -
 a*d)^3*g*i^3) + (b^2*B^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^
3*g*i^3) - (b^2*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2
)/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Lo
g[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*
x)^(-n)]))/((b*c - a*d)^3*g*i^3) + (2*A*b^2*B*n*PolyLog[2, -((d*(a + b*x))/
(b*c - a*d))])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*n^2*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*n*Log[(a + b*x)^n]*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (2*A*b^2*
B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (3*b^2*B
^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^
2*B^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c -
a*d)^3*g*i^3) - (2*b^2*B^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x)
)^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c -
a*d)^3*g*i^3) + (2*b^2*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 +
(b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n^2*PolyLog[
3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n^2*Po
lyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n^2
*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
```

```
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
```

```
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
```

```
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(206c+206dx)^3(ag+bgx)}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^3g(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)g(c+dx)^3} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g\cdots}\right.$$

$$= \frac{b^3\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}dx}{8741816(bc-ad)^3g} - \frac{\left(b^2d\right)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}dx}{8741816(bc-ad)^3g} - \frac{(bd)\int\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2}\cdots}{8741816(bc-ad)^2g\cdots}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{8741816(bc\cdots}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{8741816(bc\cdots}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{8741816(bc\cdots}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc-ad)g(c+dx)^2} + \frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc-ad)^2g(c+dx)} + \frac{b^2\log(a+bx)\left(A+\cdots\right.}{8741816(bc\cdots}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17483632(bc-ad)g(c+dx)^2} - \frac{3bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8741816(bc-ad)^2g(c+dx)} - \frac{3b^2Bn\log(a+bx)\cdots}{874181\cdots}$$

$$= -\frac{b^2B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc-ad)^3g} - \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17483632(bc-ad)g(c+dx)^2} - \frac{3bBn\left(A+B\,\mathrm{lo}\cdots\right.}{8741816(bc-\cdots}$$

$$= -\frac{b^2B^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc-ad)^3g} - \frac{b^2B^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc-ad)^3g} - \frac{Bn\left(A\cdots\right.}{1748363\cdots}$$

$$= \frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2} + \frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)} + \frac{7b^2B^2n^2\log(a+bx\cdots}{17483632(bc-ad)^3\cdots}$$

$$= \frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2} + \frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)} + \frac{7b^2B^2n^2\log(a+bx\cdots}{17483632(bc-ad)^3\cdots}$$

$$= \frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2} + \frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)} + \frac{7b^2B^2n^2\log(a+bx\cdots}{17483632(bc-ad)^3\cdots}$$

$$= \frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2} + \frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)} + \frac{7b^2B^2n^2\log(a+bx\cdots}{17483632(bc-ad)^3\cdots}$$

$$= \frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2} + \frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)} + \frac{7b^2B^2n^2\log(a+bx\cdots}{17483632(bc-ad)^3\cdots}$$

$$= \frac{B^2n^2}{34967264(bc-ad)g(c+dx)^2} + \frac{7bB^2n^2}{17483632(bc-ad)^2g(c+dx)} + \frac{7b^2B^2n^2\log(a+bx\cdots}{17483632(bc-ad)^3\cdots}$$

Mathematica [B] time = 1.3402, size = 971, normalized size = 2.42

$$4b^2B^2n^2\log^3\left(\frac{a+bx}{c+dx}\right)-\frac{6Bn\left(-2Ac^2b^2-2Ad^2x^2b^2+3Bd^2nx^2b^2-4Acdxb^2+4Bcdnxb^2-2B(c+dx)^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)b^2+2Bn(c+dx)^2\log\left(\frac{a+bx}{c+dx}\right)b^2+4aBcdnb+\right.}{(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*
i*x)^3),x]
```

```
[Out] (4*b^2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^3 - (6*B*n*Log[(a + b*x)/(c + d*x)]
^2*(-2*A*b^2*c^2 + 4*a*b*B*c*d*n - a^2*B*d^2*n - 4*A*b^2*c*d*x + 4*b^2*B*c*
d*n*x + 2*a*b*B*d^2*n*x - 2*A*b^2*d^2*x^2 + 3*b^2*B*d^2*n*x^2 - 2*b^2*B*(c
+ d*x)^2*Log[e*((a + b*x)/(c + d*x))^n] + 2*b^2*B*n*(c + d*x)^2*Log[(a + b*
x)/(c + d*x)]))/(c + d*x)^2 - (6*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(
-6*A*b*c + 2*a*A*d + 7*b*B*c*n - a*B*d*n - 4*A*b*d*x + 6*b*B*d*n*x + 2*B*(-
3*b*c + a*d - 2*b*d*x)*Log[e*((a + b*x)/(c + d*x))^n] + 2*B*n*(3*b*c - a*d
+ 2*b*d*x)*Log[(a + b*x)/(c + d*x)]))/(c + d*x)^2 + (3*(b*c - a*d)^2*(2*A^2
 - 2*A*B*n + B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A
 + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2
*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*
x)])))/(c + d*x)^2 + (6*b*(b*c - a*d)*(2*A^2 - 6*A*B*n + 7*B^2*n^2 + 2*B^2*
Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + 3*B*n)*Log[(a + b*x)/(c +
d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*
x))^n]*(-2*A + 3*B*n + 2*B*n*Log[(a + b*x)/(c + d*x)])))/(c + d*x) + 6*b^2*
Log[a + b*x]*(2*A^2 - 6*A*B*n + 7*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x
))^n]^2 + 2*B*n*(-2*A + 3*B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a
+ b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + 3*B*n + 2*
B*n*Log[(a + b*x)/(c + d*x)])) - 6*b^2*(2*A^2 - 6*A*B*n + 7*B^2*n^2 + 2*B^2
*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + 3*B*n)*Log[(a + b*x)/(c +
 d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d
*x))^n]*(-2*A + 3*B*n + 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/(12*
(b*c - a*d)^3*g*i^3)
```

Maple [F] time = 0.693, size = 0, normalized size = 0.

$$\int\frac{1}{(bgx+ag)(dix+ci)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 2.02039, size = 2870, normalized size = 7.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B^2*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i
^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a
*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(e*(b*x/(d*x + c) + a/(d*x +
 c))^n)^2 + A*B*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*
d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c
^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a
*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3
 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n) + 1/12*((45*b^2*c^2 - 48*a*b*c*d + 3*a^2*d^2 + 4*(b^2*d^2*x
^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^3 - 4*(b^2*d^2*x^2 + 2*b^2*c*d*x +
 b^2*c^2)*log(d*x + c)^3 + 18*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x
 + a)^2 + 6*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b
^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c)^2 + 42*(b^2*c*d - a*b*d^2)*x
 + 42*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 6*(7*b^2*d^2*x^2
 + 14*b^2*c*d*x + 7*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b
*x + a)^2 + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x +
 c))*n^2/(b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3
*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4
*g*i^3 - a^3*d^5*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 +
3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x) - 6*(7*b^2*c^2 - 8*a*b*c*d + a^
2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2
*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*
(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b
^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)
)*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^3*c^5*g*i^3 - 3
*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d
^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x^2
 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3
*c*d^4*g*i^3)*x))*B^2 - 1/2*(7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x
^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x +
 b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2
*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2
 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))*A*B*
n/(b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^
3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4*g*i^3
- a^3*d^5*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b
*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x) + 1/2*A^2*((2*b*d*x + 3*b*c - a*d)/((b
^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^
2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b
^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3)
 - 2*b^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*
g*i^3))
```

Fricas [B] time = 0.577054, size = 2228, normalized size = 5.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
lgorithm="fricas")
```

```
[Out] 1/12*(18*A^2*b^2*c^2 - 24*A^2*a*b*c*d + 6*A^2*a^2*d^2 + 4*(B^2*b^2*d^2*n^2*
x^2 + 2*B^2*b^2*c*d*n^2*x + B^2*b^2*c^2*n^2)*log((b*x + a)/(d*x + c))^3 + 3
*(15*B^2*b^2*c^2 - 16*B^2*a*b*c*d + B^2*a^2*d^2)*n^2 + 6*(3*B^2*b^2*c^2 - 4
```

```
*B^2*a*b*c*d + B^2*a^2*d^2 + 2*(B^2*b^2*c*d - B^2*a*b*d^2)*x + 2*(B^2*b^2*d
^2*x^2 + 2*B^2*b^2*c*d*x + B^2*b^2*c^2)*log((b*x + a)/(d*x + c)))*log(e)^2
+ 6*(2*A*B*b^2*c^2*n - (4*B^2*a*b*c*d - B^2*a^2*d^2)*n^2 - (3*B^2*b^2*d^2*n
^2 - 2*A*B*b^2*d^2*n)*x^2 + 2*(2*A*B*b^2*c*d*n - (2*B^2*b^2*c*d + B^2*a*b*d
^2)*n^2)*x)*log((b*x + a)/(d*x + c))^2 - 6*(7*A*B*b^2*c^2 - 8*A*B*a*b*c*d +
 A*B*a^2*d^2)*n + 6*(2*A^2*b^2*c*d - 2*A^2*a*b*d^2 + 7*(B^2*b^2*c*d - B^2*a
*b*d^2)*n^2 - 6*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x + 6*(6*A*B*b^2*c^2 - 8*A*B
*a*b*c*d + 2*A*B*a^2*d^2 + 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*b^2*c*d*n*x + B^2*b
^2*c^2*n)*log((b*x + a)/(d*x + c))^2 - (7*B^2*b^2*c^2 - 8*B^2*a*b*c*d + B^2
*a^2*d^2)*n + 2*(2*A*B*b^2*c*d - 2*A*B*a*b*d^2 - 3*(B^2*b^2*c*d - B^2*a*b*d
^2)*n)*x + 2*(2*A*B*b^2*c^2 - (3*B^2*b^2*d^2*n - 2*A*B*b^2*d^2)*x^2 - (4*B^
2*a*b*c*d - B^2*a^2*d^2)*n + 2*(2*A*B*b^2*c*d - (2*B^2*b^2*c*d + B^2*a*b*d^
2)*n)*x)*log((b*x + a)/(d*x + c)))*log(e) + 6*(2*A^2*b^2*c^2 + (8*B^2*a*b*c
*d - B^2*a^2*d^2)*n^2 + (7*B^2*b^2*d^2*n^2 - 6*A*B*b^2*d^2*n + 2*A^2*b^2*d^
2)*x^2 - 2*(4*A*B*a*b*c*d - A*B*a^2*d^2)*n + 2*(2*A^2*b^2*c*d + (4*B^2*b^2*
c*d + 3*B^2*a*b*d^2)*n^2 - 2*(2*A*B*b^2*c*d + A*B*a*b*d^2)*n)*x)*log((b*x +
 a)/(d*x + c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^4 - a^3*d^5)*
g*i^3*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^3 - a^3*c*d^4)*g
*i^3*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c^2*d^3)*g*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(bgx+ag)(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)*(d*i*x +
c*i)^3), x)
```

3.207 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^3}\,dx$

Optimal. Leaf size=562

$$-\frac{b^3(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2i^3(a+bx)(bc-ad)^4}-\frac{2b^3Bn(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}-\frac{b^2d\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{Bg^2i^3n(bc-ad)^4}+\frac{3bd^2(a}{}$$

```
[Out] -(B^2*d^3*n^2*(a + b*x)^2)/(4*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (6*A*b*B
*d^2*n*(a + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) + (6*b*B^2*d^2*n^2*(a +
 b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (2*b^3*B^2*n^2*(c + d*x))/((b*c
- a*d)^4*g^2*i^3*(a + b*x)) - (6*b*B^2*d^2*n*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n])/((b*c - a*d)^4*g^2*i^3*(c + d*x)) + (B*d^3*n*(a + b*x)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (
2*b^3*B*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*
g^2*i^3*(a + b*x)) - (d^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*(c
+ d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^2*i^3*(a
+ b*x)) - (b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(B*(b*c - a*d)^4
*g^2*i^3*n)
```

Rubi [C] time = 8.13443, antiderivative size = 2207, normalized size of antiderivative = 3.93, number of steps used = 135, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)
^3),x]
```

```
[Out] (-2*b^2*B^2*n^2)/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (B^2*d*n^2)/(4*(b*c -
a*d)^2*g^2*i^3*(c + d*x)^2) - (11*b*B^2*d*n^2)/(2*(b*c - a*d)^3*g^2*i^3*(c
+ d*x)) - (15*b^2*B^2*d*n^2*Log[a + b*x])/(2*(b*c - a*d)^4*g^2*i^3) + (3*A*
b^2*B*d*n*Log[a + b*x]^2)/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*n^2*Log[a
+ b*x]^2)/(2*(b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[-((b*c - a*d)/(d*(a
+ b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^
2*B^2*d*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^2*i
^3) - (2*b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2
*i^3*(a + b*x)) + (B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c -
a*d)^2*g^2*i^3*(c + d*x)^2) + (5*b*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/((b*c - a*d)^3*g^2*i^3*(c + d*x)) + (3*b^2*B*d*n*Log[a + b*x]*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^2*i^3) - (b^2*(A + B*Log[
e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (d*(A +
B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2)
- (2*b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^2*i^3*(
c + d*x)) - (3*b^2*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)
/((b*c - a*d)^4*g^2*i^3) + (15*b^2*B^2*d*n^2*Log[c + d*x])/(2*(b*c - a*d)^4
*g^2*i^3) - (6*A*b^2*B*d*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/
((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n^2*Log[-((d*(a + b*x))/(b*c - a*d))
```

```
]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[(a + b*x)^n]^2*L
og[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*n*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*d*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*A
*b^2*B*d*n*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*n^2*Log[c
 + d*x]^2)/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*n^2*Log[a + b*x]*Log[c
+ d*x]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n*Log[e*((a + b*x)/(c + d*
x))^n]*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) + (b^2*B^2*d*n^2*Log[c + d*x
]^3)/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*n*Log[a + b*x]*Log[(b*(c + d*x)
)/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[(a
+ b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) - (6*b^
2*B^2*d*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^4*g^2
*i^3) - (3*b^2*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^2
*i^3) + (3*b^2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^
2)/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*n*Log[-((d*(a + b*x))/(b*c - a*d)
)]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c
 + d*x)^(-n)]))/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*n*PolyLog[2, -((d*(a
 + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n^2*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*n*
Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g
^2*i^3) - (6*A*b^2*B*d*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d
)^4*g^2*i^3) + (3*b^2*B^2*d*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*
c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*n*(Log[(a + b*x
)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n*Log[e*((a
 + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*
d)^4*g^2*i^3) - (6*b^2*B^2*d*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/
((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n^2*PolyLog[3, (b*(c + d*x))/(b*c -
a*d)])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n^2*PolyLog[3, 1 + (b*c - a*d
)/(d*(a + b*x))])/((b*c - a*d)^4*g^2*i^3)
```

<u>Rule 2528</u>

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

<u>Rule 2525</u>

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

<u>Rule 12</u>

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

<u>Rule 44</u>

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
```

```
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
```

```
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(207c+207dx)^3(ag+bgx)^2}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)^2} - \frac{b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2956581(bc-ad)^4g^2(a+bx)} + \frac{d^2\left(A+B\log\right.}{8869743(bc-}\right.$$

$$= -\frac{\left(b^3d\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{2956581(bc-ad)^4g^2} + \frac{\left(b^2d^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{2956581(bc-ad)^4g^2} + \frac{b^3\int \frac{\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{(a+bx)^2}}{8869743(bc-}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log\right.}{8869743(bc-a}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log\right.}{8869743(bc-a}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log\right.}{8869743(bc-a}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc-ad)^2g^2(c+dx)^2} - \frac{2bd\left(A+B\log\right.}{8869743(bc-a}$$

$$= -\frac{2b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc-ad)^3g^2(a+bx)} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17739486(bc-ad)^2g^2(c+dx)^2} + \frac{5bBdn\left(A+\right.}{8869743(bc-}$$

$$= \frac{b^2B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc-ad)^4g^2} - \frac{2b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc-ad)^3g^2(a+bx)} + \frac{Bdn\left(A+\right.}{17739486(b}$$

$$= \frac{b^2B^2d\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc-ad)^4g^2} + \frac{b^2B^2d\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc-ad)^4g^2} - \frac{2b^2Bn}{8869}$$

$$= -\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2}{17739486(bc-}$$

$$= -\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2}{17739486(bc-}$$

$$= -\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2}{17739486(bc-}$$

$$= -\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2}{17739486(bc-}$$

$$= -\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2}{17739486(bc-}$$

$$= -\frac{2b^2B^2n^2}{8869743(bc-ad)^3g^2(a+bx)} - \frac{B^2dn^2}{35478972(bc-ad)^2g^2(c+dx)^2} - \frac{11bB^2}{17739486(bc-}$$

Mathematica [B] time = 2.12528, size = 1334, normalized size = 2.37

$$-\frac{4b^2B^2dn^2(a+bx)(c+dx)^2\log^3\left(\frac{a+bx}{c+dx}\right)+2Bn\left(6Ad^3x^3b^3-3Bd^3nx^3b^3+12Acd^2x^2b^3+2Bc^3nb^3+6Ac^2dxb^3+6Bc^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i +
d*i*x)^3),x]
```

```
[Out] -(4*b^2*B^2*d*n^2*(a + b*x)*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]^3 + 2*B*n*
Log[(a + b*x)/(c + d*x)]^2*(6*a*A*b^2*c^2*d + 2*b^3*B*c^3*n - 6*a^2*b*B*c*d
^2*n + a^3*B*d^3*n + 6*A*b^3*c^2*d*x + 12*a*A*b^2*c*d^2*x + 6*b^3*B*c^2*d*n
*x - 12*a*b^2*B*c*d^2*n*x - 3*a^2*b*B*d^3*n*x + 12*A*b^3*c*d^2*x^2 + 6*a*A*
b^2*d^3*x^2 - 9*a*b^2*B*d^3*n*x^2 + 6*A*b^3*d^3*x^3 - 3*b^3*B*d^3*n*x^3 + 6
*b^2*B*d*(a + b*x)*(c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n] - 6*b^2*B*d*n
*(a + b*x)*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]) + 4*b^2*(b*c - a*d)*(c + d
*x)^2*(A^2 + 2*A*B*n + 2*B^2*n^2 + B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2
*B*n*(A + B*n)*Log[(a + b*x)/(c + d*x)] + B^2*n^2*Log[(a + b*x)/(c + d*x)]^
2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(A + B*n - B*n*Log[(a + b*x)/(c + d*
x)])) + 2*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(2*b*d*(a + b*x)*(c + d*
x)*(4*A - 5*B*n + 4*B*Log[e*((a + b*x)/(c + d*x))^n] - 4*B*n*Log[(a + b*x)/
(c + d*x)]) + d*(b*c - a*d)*(a + b*x)*(2*A - B*n + 2*B*Log[e*((a + b*x)/(c
+ d*x))^n] - 2*B*n*Log[(a + b*x)/(c + d*x)]) + 4*b^2*(c + d*x)^2*(A + B*n +
 B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])) + d*(b*c
 - a*d)^2*(a + b*x)*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c
+ d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[
(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2
*B*n*Log[(a + b*x)/(c + d*x)])) + 6*b^2*d*(a + b*x)*(c + d*x)^2*Log[a + b*x
]*(2*A^2 - 2*A*B*n + 5*B^2*n^2 + 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2
*B*n*(-2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d
*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*
x)/(c + d*x)])) + 2*b*d*(b*c - a*d)*(a + b*x)*(c + d*x)*(4*A^2 - 10*A*B*n +
 11*B^2*n^2 + 4*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-4*A + 5*B*n)
*Log[(a + b*x)/(c + d*x)] + 4*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[
e*((a + b*x)/(c + d*x))^n]*(-4*A + 5*B*n + 4*B*n*Log[(a + b*x)/(c + d*x)]))
 - 6*b^2*d*(a + b*x)*(c + d*x)^2*(2*A^2 - 2*A*B*n + 5*B^2*n^2 + 2*B^2*Log[e
*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/(c + d*x)] +
 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*
(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x])/(4*(b*c - a*d)
^4*g^2*i^3*(a + b*x)*(c + d*x)^2)
```

Maple [F] time = 0.698, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}(dix+ci)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 2.9237, size = 5669, normalized size = 10.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] -1/2*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d +
 a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)
*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c
*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 +
5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3
*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4
*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^
2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*
d^3 + a^4*d^4)*g^2*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 - A*B*((6
*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)
/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3
 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d
^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*
d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d
^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d
 + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x
+ c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^
4)*g^2*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/4*((8*b^3*c^3 + 15*
a*b^2*c^2*d - 24*a^2*b*c*d^2 + a^3*d^3 + 4*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*
b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a)^3
- 4*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d
 + 2*a*b^2*c*d^2)*x)*log(d*x + c)^3 + 30*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b
^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a
*b^2*c*d^2)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2
 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*
c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(
b*x + a))*log(d*x + c)^2 + 3*(13*b^3*c^2*d - 6*a*b^2*c*d^2 - 7*a^2*b*d^3)*x
 + 30*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2
*d + 2*a*b^2*c*d^2)*x)*log(b*x + a) - 6*(5*b^3*d^3*x^3 + 5*a*b^2*c^2*d + 5*
(2*b^3*c*d^2 + a*b^2*d^3)*x^2 + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2
 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 + 5*(b^3*
c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*
b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*n
^2/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3
 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3 - 4
*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^
3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3
 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^
2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2
*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*
i^3 + 2*a^5*c*d^5*g^2*i^3)*x) + 2*(4*b^3*c^3 - 15*a*b^2*c^2*d + 12*a^2*b*c*
d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*
d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x
+ a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^
3*c^2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*(b^3*c^2*d + 2*a*b^2*c*d^2 -
 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*
x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a) + 6*(b^3*d^3*x^3 + a*b^2*
c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(
b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*
a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x
```

```
 + c))^n)/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*
g^2*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*
i^3 - 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5
*g^2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*
g^2*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c
*d^5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*
i^3 - 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d
^4*g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x))*B^2 - 1/2*(4*b^3*c^3 - 15*a*b^2*c^2*d
 + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 6*(b^3*d^3*x^
3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^
2)*x)*log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*
d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*(b^3*c^2*d + 2
*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2
 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a) + 6*(b^3*d^
3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*
c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (
b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c))*A*B*n/(a*b^4*c^6*
g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3 - 4*a^4*b*c^3
*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3 - 4*a*b^4*c^3*d^3
*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^3 + a^4*b*d^6*
g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3 + 8*a^2*b^3*c
^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^2*i^3 + a^5*d^
6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2*a^2*b^3*c^4*d
^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*i^3 + 2*a^5*c*
d^5*g^2*i^3)*x) - 1/2*A^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2
 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c
*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*
c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a
^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*
a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x +
 a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4
)*g^2*i^3) - 6*b^2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2
*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3))
```

Fricas [B] time = 0.700824, size = 4177, normalized size = 7.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] -1/4*(4*A^2*b^3*c^3 + 6*A^2*a*b^2*c^2*d - 12*A^2*a^2*b*c*d^2 + 2*A^2*a^3*d^
3 + 4*(B^2*b^3*d^3*n^2*x^3 + B^2*a*b^2*c^2*d*n^2 + (2*B^2*b^3*c*d^2 + B^2*a
*b^2*d^3)*n^2*x^2 + (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2)*n^2*x)*log((b*x + a
)/(d*x + c))^3 + (8*B^2*b^3*c^3 + 15*B^2*a*b^2*c^2*d - 24*B^2*a^2*b*c*d^2 +
 B^2*a^3*d^3)*n^2 + 6*(2*A^2*b^3*c*d^2 - 2*A^2*a*b^2*d^3 + 5*(B^2*b^3*c*d^2
 - B^2*a*b^2*d^3)*n^2 - 2*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*n)*x^2 + 2*(2*B^2
*b^3*c^3 + 3*B^2*a*b^2*c^2*d - 6*B^2*a^2*b*c*d^2 + B^2*a^3*d^3 + 6*(B^2*b^3
*c*d^2 - B^2*a*b^2*d^3)*x^2 + 3*(3*B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2 - B^2*
a^2*b*d^3)*x + 6*(B^2*b^3*d^3*x^3 + B^2*a*b^2*c^2*d + (2*B^2*b^3*c*d^2 + B^
2*a*b^2*d^3)*x^2 + (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2)*x)*log((b*x + a)/(d*
x + c)))*log(e)^2 + 2*(6*A*B*a*b^2*c^2*d*n - 3*(B^2*b^3*d^3*n^2 - 2*A*B*b^3
*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 6*B^2*a^2*b*c*d^2 + B^2*a^3*d^3)*n^2 - 3*(3*
B^2*a*b^2*d^3*n^2 - 2*(2*A*B*b^3*c*d^2 + A*B*a*b^2*d^3)*n)*x^2 + 3*((2*B^2*
b^3*c^2*d - 4*B^2*a*b^2*c*d^2 - B^2*a^2*b*d^3)*n^2 + 2*(A*B*b^3*c^2*d + 2*A
```

```
*B*a*b^2*c*d^2)*n)*x)*log((b*x + a)/(d*x + c))^2 + 2*(4*A*B*b^3*c^3 - 15*A*
B*a*b^2*c^2*d + 12*A*B*a^2*b*c*d^2 - A*B*a^3*d^3)*n + 3*(6*A^2*b^3*c^2*d -
4*A^2*a*b^2*c*d^2 - 2*A^2*a^2*b*d^3 + (13*B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2
 - 7*B^2*a^2*b*d^3)*n^2 - 2*(A*B*b^3*c^2*d + 2*A*B*a*b^2*c*d^2 - 3*A*B*a^2*
b*d^3)*n)*x + 2*(4*A*B*b^3*c^3 + 6*A*B*a*b^2*c^2*d - 12*A*B*a^2*b*c*d^2 + 2
*A*B*a^3*d^3 + 6*(2*A*B*b^3*c*d^2 - 2*A*B*a*b^2*d^3 - (B^2*b^3*c*d^2 - B^2*
a*b^2*d^3)*n)*x^2 + 6*(B^2*b^3*d^3*n*x^3 + B^2*a*b^2*c^2*d*n + (2*B^2*b^3*c
*d^2 + B^2*a*b^2*d^3)*n*x^2 + (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2)*n*x)*log(
(b*x + a)/(d*x + c))^2 + (4*B^2*b^3*c^3 - 15*B^2*a*b^2*c^2*d + 12*B^2*a^2*b
*c*d^2 - B^2*a^3*d^3)*n + 3*(6*A*B*b^3*c^2*d - 4*A*B*a*b^2*c*d^2 - 2*A*B*a^
2*b*d^3 - (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2 - 3*B^2*a^2*b*d^3)*n)*x + 2*(6
*A*B*a*b^2*c^2*d - 3*(B^2*b^3*d^3*n - 2*A*B*b^3*d^3)*x^3 - 3*(3*B^2*a*b^2*d
^3*n - 4*A*B*b^3*c*d^2 - 2*A*B*a*b^2*d^3)*x^2 + (2*B^2*b^3*c^3 - 6*B^2*a^2*
b*c*d^2 + B^2*a^3*d^3)*n + 3*(2*A*B*b^3*c^2*d + 4*A*B*a*b^2*c*d^2 + (2*B^2*
b^3*c^2*d - 4*B^2*a*b^2*c*d^2 - B^2*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c
)))*log(e) + 2*(6*A^2*a*b^2*c^2*d + 3*(5*B^2*b^3*d^3*n^2 - 2*A*B*b^3*d^3*n
+ 2*A^2*b^3*d^3)*x^3 + (4*B^2*b^3*c^3 + 12*B^2*a^2*b*c*d^2 - B^2*a^3*d^3)*n
^2 - 3*(6*A*B*a*b^2*d^3*n - 4*A^2*b^3*c*d^2 - 2*A^2*a*b^2*d^3 - (8*B^2*b^3*
c*d^2 + 7*B^2*a*b^2*d^3)*n^2)*x^2 + 2*(2*A*B*b^3*c^3 - 6*A*B*a^2*b*c*d^2 +
A*B*a^3*d^3)*n + 3*(2*A^2*b^3*c^2*d + 4*A^2*a*b^2*c*d^2 + (4*B^2*b^3*c^2*d
+ 8*B^2*a*b^2*c*d^2 + 3*B^2*a^2*b*d^3)*n^2 + 2*(2*A*B*b^3*c^2*d - 4*A*B*a*b
^2*c*d^2 - A*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c)))/((b^5*c^4*d^2 - 4
*a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a^4*b*d^6)*g^2*i^3*x
^3 + (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2*c^2*d^4
 - 2*a^4*b*c*d^5 + a^5*d^6)*g^2*i^3*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d - 2*a^2*
b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*i^3*x
+ (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 + a^5*
c^2*d^4)*g^2*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{\left(bgx+ag\right)^2(dix+ci)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^2*(d*i*x
+ c*i)^3), x)
```

3.208 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^3}\,dx$

Optimal. Leaf size=732

$$\frac{2b^2d^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^3}{Bg^3i^3n(bc-ad)^5}-\frac{b^4(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3i^3(a+bx)^2(bc-ad)^5}-\frac{b^4Bn(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5}+\frac{4b}{}$$

```
[Out] (B^2*d^4*n^2*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*A*b*B*
d^3*n*(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (8*b*B^2*d^3*n^2*(a +
b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (8*b^3*B^2*d*n^2*(c + d*x))/((b*c
 - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B^2*n^2*(c + d*x)^2)/(4*(b*c - a*d)^5*g
^3*i^3*(a + b*x)^2) + (8*b*B^2*d^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^
n])/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (B*d^4*n*(a + b*x)^2*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*b^3*B*
d*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^3*i^
3*(a + b*x)) - (b^4*B*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (d^4*(a + b*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(
a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^3*i^3*(
c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((
b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2)/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (2*b^2*d^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^3)/(B*(b*c - a*d)^5*g^3*i^3*n)
```

Rubi [C] time = 9.22738, antiderivative size = 2041, normalized size of antiderivative = 2.79, number of steps used = 163, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)
^3),x]
```

```
[Out] -(b^2*B^2*n^2)/(4*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (15*b^2*B^2*d*n^2)/(
2*(b*c - a*d)^4*g^3*i^3*(a + b*x)) + (B^2*d^2*n^2)/(4*(b*c - a*d)^3*g^3*i^3
*(c + d*x)^2) + (15*b*B^2*d^2*n^2)/(2*(b*c - a*d)^4*g^3*i^3*(c + d*x)) + (1
5*b^2*B^2*d^2*n^2*Log[a + b*x])/((b*c - a*d)^5*g^3*i^3) - (6*A*b^2*B*d^2*n*
Log[a + b*x]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((b*c - a*d)/
(d*(a + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^5*g^3*i^3) -
 (6*b^2*B^2*d^2*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)
^5*g^3*i^3) - (b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*
d)^3*g^3*i^3*(a + b*x)^2) + (7*b^2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/((b*c - a*d)^4*g^3*i^3*(a + b*x)) - (B*d^2*n*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) - (7*b*B*d^2*n*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^3*(c + d*x)) - (b^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g^3*i^3*(a + b*x
)^2) + (3*b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^
3*i^3*(a + b*x)) + (d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c -
 a*d)^3*g^3*i^3*(c + d*x)^2) + (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
```

```
n])^2)/((b*c - a*d)^4*g^3*i^3*(c + d*x)) + (6*b^2*d^2*Log[a + b*x]*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^3*i^3) - (15*b^2*B^2*d^2
*n^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*n*Log[-((d*(a
+ b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^
2*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (6*b^2*d^2*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3)
 - (6*A*b^2*B*d^2*n*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^
2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2
*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) -
 (2*b^2*B^2*d^2*n^2*Log[c + d*x]^3)/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d
^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) -
 (6*b^2*B^2*d^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c -
a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)
^(-n)])/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]*Log[(c + d*x)
^(-n)]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((d*(a + b*x))/(b*c
 - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^2*d^2*
n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*
((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^5*g^3*i^3) +
(12*A*b^2*B*d^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*
g^3*i^3) - (12*b^2*B^2*d^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b
*c - a*d))])/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*n*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*n*Log[(c + d
*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) -
(12*b^2*B^2*d^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[
(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*
i^3) + (12*b^2*B^2*d^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c
 - a*d)/(d*(a + b*x))])/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*n^2*PolyL
og[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*
d^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^3*i^3) + (1
2*b^2*B^2*d^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^5
*g^3*i^3)
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
```

```
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
```

```
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(208c+208dx)^3(ag+bgx)^3}\,dx = \int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^3g^3(a+bx)^3} - \frac{3b^3d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)^2} + \frac{3b^3d^2\left(A \cdots\right.}{4499456\cdots}\right.$$

$$= \frac{\left(3b^3d^2\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx}\,dx}{4499456(bc-ad)^5g^3} - \frac{\left(3b^2d^3\right)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx}\,dx}{4499456(bc-ad)^5g^3} - \frac{\left(3b^3d\right)\int \cdots}{899891\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+\cdots\right.}{17997824(\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+\cdots\right.}{17997824(\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+\cdots\right.}{17997824(\cdots}$$

$$= -\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{3b^2d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc-ad)^4g^3(a+bx)} + \frac{d^2\left(A+\cdots\right.}{17997824(\cdots}$$

$$= -\frac{b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8998912(bc-ad)^4g^3(a+bx)} - \frac{Bd^2n\left(A\cdots\right.}{17997824\cdots}$$

$$= -\frac{3b^2B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc-ad)^5g^3} - \frac{b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17997824(bc-ad)^3g^3(a+bx)^2} + \frac{7b^2B\cdots}{899\cdots}$$

$$= -\frac{3b^2B^2d^2\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc-ad)^5g^3} - \frac{3b^2B^2d^2\log(a+bx)\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc-ad)^5g^3} \cdots$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} + \frac{\cdots}{35995648(\cdots}$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} + \frac{\cdots}{35995648(\cdots}$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} + \frac{\cdots}{35995648(\cdots}$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} + \frac{\cdots}{35995648(\cdots}$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} + \frac{\cdots}{35995648(\cdots}$$

$$= -\frac{b^2B^2n^2}{35995648(bc-ad)^3g^3(a+bx)^2} + \frac{15b^2B^2dn^2}{17997824(bc-ad)^4g^3(a+bx)} + \frac{\cdots}{35995648(\cdots}$$

Mathematica [B] time = 2.64962, size = 1653, normalized size = 2.26

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i +
d*i*x)^3),x]
```

```
[Out] (8*b^2*B^2*d^2*n^2*(a + b*x)^2*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]^3 + 2*B
*n*Log[(a + b*x)/(c + d*x)]^2*(12*a^2*A*b^2*c^2*d^2 - b^4*B*c^4*n + 8*a*b^3
*B*c^3*d*n - 8*a^3*b*B*c*d^3*n + a^4*B*d^4*n + 24*a*A*b^3*c^2*d^2*x + 24*a^
2*A*b^2*c*d^3*x + 4*b^4*B*c^3*d*n*x + 24*a*b^3*B*c^2*d^2*n*x - 24*a^2*b^2*B
*c*d^3*n*x - 4*a^3*b*B*d^4*n*x + 12*A*b^4*c^2*d^2*x^2 + 48*a*A*b^3*c*d^3*x^
2 + 12*a^2*A*b^2*d^4*x^2 + 18*b^4*B*c^2*d^2*n*x^2 - 18*a^2*b^2*B*d^4*n*x^2
+ 24*A*b^4*c*d^3*x^3 + 24*a*A*b^3*d^4*x^3 + 12*b^4*B*c*d^3*n*x^3 - 12*a*b^3
*B*d^4*n*x^3 + 12*A*b^4*d^4*x^4 + 12*b^2*B*d^2*(a + b*x)^2*(c + d*x)^2*Log[
e*((a + b*x)/(c + d*x))^n] - 12*b^2*B*d^2*n*(a + b*x)^2*(c + d*x)^2*Log[(a
+ b*x)/(c + d*x)]) + 12*b^2*d^2*(a + b*x)^2*(c + d*x)^2*Log[a + b*x]*(2*A^2
 + 5*B^2*n^2 + 4*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c +
 d*x)]) + 2*B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)
])^2) + 2*b^2*d*(b*c - a*d)*(a + b*x)*(c + d*x)^2*(6*A^2 + 14*A*B*n + 15*B^
2*n^2 + 6*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(6*A + 7*B*n)*Log[(a
 + b*x)/(c + d*x)] + 6*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a +
 b*x)/(c + d*x))^n]*(6*A + 7*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) - b^2*(
b*c - a*d)^2*(c + d*x)^2*(2*A^2 + 2*A*B*n + B^2*n^2 + 2*B^2*Log[e*((a + b*x
)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*Log[(a + b*x)/(c + d*x)] + 2*B^2*n^2*
Log[(a + b*x)/(c + d*x)]^2 + 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(2*A + B*n
- 2*B*n*Log[(a + b*x)/(c + d*x)])) + 2*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d
*x)]*(2*b*d^2*(a + b*x)^2*(c + d*x)*(6*A - 7*B*n + 6*B*Log[e*((a + b*x)/(c
+ d*x))^n] - 6*B*n*Log[(a + b*x)/(c + d*x)]) + 2*b^2*d*(a + b*x)*(c + d*x)^
2*(6*A + 7*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*x)/(
c + d*x)]) + d^2*(b*c - a*d)*(a + b*x)^2*(2*A - B*n + 2*B*Log[e*((a + b*x)/
(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c + d*x)]) - b^2*(b*c - a*d)*(c + d*x)
^2*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c
 + d*x)])) + d^2*(b*c - a*d)^2*(a + b*x)^2*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B
^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/(c +
 d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d
*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*x)])) + 2*b*d^2*(b*c - a*d
)*(a + b*x)^2*(c + d*x)*(6*A^2 - 14*A*B*n + 15*B^2*n^2 + 6*B^2*Log[e*((a +
b*x)/(c + d*x))^n]^2 + 2*B*n*(-6*A + 7*B*n)*Log[(a + b*x)/(c + d*x)] + 6*B^
2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*(-6*A
 + 7*B*n + 6*B*n*Log[(a + b*x)/(c + d*x)])) - 12*b^2*d^2*(a + b*x)^2*(c + d
*x)^2*(2*A^2 + 5*B^2*n^2 + 4*A*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a
 + b*x)/(c + d*x)]) + 2*B^2*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*
x)/(c + d*x)])^2)*Log[c + d*x])/(4*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2*(c + d
*x)^2)
```

Maple [F] time = 0.737, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 3.28386, size = 7552, normalized size = 10.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,
 algorithm="maxima")
```

```
[Out] 1/2*B^2*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^
3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d
^3)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^
5 + a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c
^3*d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^
6*c^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^
6)*g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4
*b^2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^
3*b^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) +
 12*b^2*d^2*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 1
0*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x
+ c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 +
5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2
 + A*B*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3
 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^
3)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5
 + a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^
3*d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6
*c^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6
)*g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*
b^2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3
*b^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) +
12*b^2*d^2*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10
*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x +
 c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5
*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) -
1/4*((b^4*c^4 - 32*a*b^3*c^3*d + 32*a^3*b*c*d^3 - a^4*d^4 - 60*(b^4*c*d^3 -
 a*b^3*d^4)*x^3 - 8*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d
^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^
2 + a^2*b^2*c*d^3)*x)*log(b*x + a)^3 - 24*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 +
2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)
*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)*log(d*x + c)^2 + 8
*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*
d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*
x)*log(d*x + c)^3 - 90*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^2 - 4*(7*b^4*c^3*d + 2
4*a*b^3*c^2*d^2 - 24*a^2*b^2*c*d^3 - 7*a^3*b*d^4)*x - 60*(b^4*d^4*x^4 + a^2
*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3
 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a) + 1
2*(5*b^4*d^4*x^4 + 5*a^2*b^2*c^2*d^2 + 10*(b^4*c*d^3 + a*b^3*d^4)*x^3 + 5*(
b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(b^4*d^4*x^4 + a^2*b^2*c
^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2
*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)^2 + 10*(a
*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(d*x + c))*n^2/(a^2*b^5*c^7*g^3*i^3 - 5
*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^2*c^4*d^3*g^
3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^5*d^2*g^3*i^
3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a^3*b^4*c^2*d
```

^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4 + 2*(b^7*c^
6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i^3 - 5*a^4*b
^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^3)*x^3 + (b^
7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3 + 25*a^3*b^
4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2*d^5*g^3*i^3
+ a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3*i^3 - 4*a^2
*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3*d^4*g^3*i^3
+ 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x) + 2*(b^4*c^4 - 16*a*b^3*c
^3*d + 30*a^2*b^2*c^2*d^2 - 16*a^3*b*c*d^3 + a^4*d^4 - 12*(b^4*c^2*d^2 - 2*
a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4
*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 +
 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)^2 - 24*(b^4*d^4*x^4 + a^
2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^
3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)*lo
g(d*x + c) + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*
x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 +
a^2*b^2*c*d^3)*x)*log(d*x + c)^2 - 12*(b^4*c^3*d - a*b^3*c^2*d^2 - a^2*b^2*
c*d^3 + a^3*b*d^4)*x)*n*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(a^2*b^5*c^7
*g^3*i^3 - 5*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^
2*c^4*d^3*g^3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^
5*d^2*g^3*i^3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a
^3*b^4*c^2*d^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4
 + 2*(b^7*c^6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i
^3 - 5*a^4*b^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^
3)*x^3 + (b^7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3
 + 25*a^3*b^4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2*
d^5*g^3*i^3 + a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3
*i^3 - 4*a^2*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3*
d^4*g^3*i^3 + 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x))*B^2 - 1/2*(b
^4*c^4 - 16*a*b^3*c^3*d + 30*a^2*b^2*c^2*d^2 - 16*a^3*b*c*d^3 + a^4*d^4 - 1
2*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 12*(b^4*d^4*x^4 + a^2*b
^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 +
 a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(b*x + a)^2 - 2
4*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2
*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)
*x)*log(b*x + a)*log(d*x + c) + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*
c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 +
2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*log(d*x + c)^2 - 12*(b^4*c^3*d - a*b^3
*c^2*d^2 - a^2*b^2*c*d^3 + a^3*b*d^4)*x)*A*B*n/(a^2*b^5*c^7*g^3*i^3 - 5*a^3
*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^2*c^4*d^3*g^3*i^
3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^5*d^2*g^3*i^3 -
5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a^3*b^4*c^2*d^5*g
^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4 + 2*(b^7*c^6*d*
g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i^3 - 5*a^4*b^3*c
^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^3)*x^3 + (b^7*c^
7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3 + 25*a^3*b^4*c^
4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2*d^5*g^3*i^3 + a^
6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3*i^3 - 4*a^2*b^5
*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3*d^4*g^3*i^3 + 4*
a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x) + 1/2*A^2*((12*b^3*d^3*x^3 -
b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d
^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((b^6*c^4*d^2 - 4*a*
b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 + a^4*b^2*d^6)*g^3*i^3*x^
4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*d^3 + 2*a^3*b^3*c^2*d^4
- 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c^6 - 9*a^2*b^4*c^4*d^2 +
 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)*g^3*i^3*x^2 + 2*(a*b^5*c
^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^2*c^3*d^3 - 3*a^5*b*c^2*
d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b^3*c^5*d + 6*a^4*b^2*c^4
*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 12*b^2*d^2*log(b*x + a)/((

```
b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b
*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^
4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^
3*i^3))
```

Fricas [B] time = 0.8252, size = 6098, normalized size = 8.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] -1/4*(2*A^2*b^4*c^4 - 16*A^2*a*b^3*c^3*d + 16*A^2*a^3*b*c*d^3 - 2*A^2*a^4*d
^4 - 12*(2*A^2*b^4*c*d^3 - 2*A^2*a*b^3*d^4 + 5*(B^2*b^4*c*d^3 - B^2*a*b^3*d
^4)*n^2)*x^3 - 8*(B^2*b^4*d^4*n^2*x^4 + B^2*a^2*b^2*c^2*d^2*n^2 + 2*(B^2*b^
4*c*d^3 + B^2*a*b^3*d^4)*n^2*x^3 + (B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 + B
^2*a^2*b^2*d^4)*n^2*x^2 + 2*(B^2*a*b^3*c^2*d^2 + B^2*a^2*b^2*c*d^3)*n^2*x)*
log((b*x + a)/(d*x + c))^3 + (B^2*b^4*c^4 - 32*B^2*a*b^3*c^3*d + 32*B^2*a^3
*b*c*d^3 - B^2*a^4*d^4)*n^2 - 6*(6*A^2*b^4*c^2*d^2 - 6*A^2*a^2*b^2*d^4 + 15
*(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*d^4)*n^2 + 4*(A*B*b^4*c^2*d^2 - 2*A*B*a*b^3
*c*d^3 + A*B*a^2*b^2*d^4)*n)*x^2 + 2*(B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d + 8*B
^2*a^3*b*c*d^3 - B^2*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*x^3 - 18*
(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*d^4)*x^2 - 4*(B^2*b^4*c^3*d + 6*B^2*a*b^3*c^
2*d^2 - 6*B^2*a^2*b^2*c*d^3 - B^2*a^3*b*d^4)*x - 12*(B^2*b^4*d^4*x^4 + B^2*
a^2*b^2*c^2*d^2 + 2*(B^2*b^4*c*d^3 + B^2*a*b^3*d^4)*x^3 + (B^2*b^4*c^2*d^2
+ 4*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*x^2 + 2*(B^2*a*b^3*c^2*d^2 + B^2*a^2
*b^2*c*d^3)*x)*log((b*x + a)/(d*x + c)))*log(e)^2 - 2*(12*A*B*b^4*d^4*n*x^4
 + 12*A*B*a^2*b^2*c^2*d^2*n + 12*((B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n^2 + 2*(
A*B*b^4*c*d^3 + A*B*a*b^3*d^4)*n)*x^3 - (B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d +
8*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n^2 + 6*(3*(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*
d^4)*n^2 + 2*(A*B*b^4*c^2*d^2 + 4*A*B*a*b^3*c*d^3 + A*B*a^2*b^2*d^4)*n)*x^2
 + 4*((B^2*b^4*c^3*d + 6*B^2*a*b^3*c^2*d^2 - 6*B^2*a^2*b^2*c*d^3 - B^2*a^3*
b*d^4)*n^2 + 6*(A*B*a*b^3*c^2*d^2 + A*B*a^2*b^2*c*d^3)*n)*x)*log((b*x + a)/
(d*x + c))^2 + 2*(A*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 30*A*B*a^2*b^2*c^2*d^2
 - 16*A*B*a^3*b*c*d^3 + A*B*a^4*d^4)*n - 4*(2*A^2*b^4*c^3*d + 12*A^2*a*b^3*
c^2*d^2 - 12*A^2*a^2*b^2*c*d^3 - 2*A^2*a^3*b*d^4 + (7*B^2*b^4*c^3*d + 24*B^
2*a*b^3*c^2*d^2 - 24*B^2*a^2*b^2*c*d^3 - 7*B^2*a^3*b*d^4)*n^2 + 6*(A*B*b^4*
c^3*d - A*B*a*b^3*c^2*d^2 - A*B*a^2*b^2*c*d^3 + A*B*a^3*b*d^4)*n)*x + 2*(2*
A*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 16*A*B*a^3*b*c*d^3 - 2*A*B*a^4*d^4 - 24*
(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*x^3 - 12*(3*A*B*b^4*c^2*d^2 - 3*A*B*a^2*b^2
*d^4 + (B^2*b^4*c^2*d^2 - 2*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n)*x^2 - 12*
(B^2*b^4*d^4*n*x^4 + B^2*a^2*b^2*c^2*d^2*n + 2*(B^2*b^4*c*d^3 + B^2*a*b^3*d
^4)*n*x^3 + (B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n*x^2 +
 2*(B^2*a*b^3*c^2*d^2 + B^2*a^2*b^2*c*d^3)*n*x)*log((b*x + a)/(d*x + c))^2
+ (B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 30*B^2*a^2*b^2*c^2*d^2 - 16*B^2*a^3*b
*c*d^3 + B^2*a^4*d^4)*n - 4*(2*A*B*b^4*c^3*d + 12*A*B*a*b^3*c^2*d^2 - 12*A*
B*a^2*b^2*c*d^3 - 2*A*B*a^3*b*d^4 + 3*(B^2*b^4*c^3*d - B^2*a*b^3*c^2*d^2 -
B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n)*x - 2*(12*A*B*b^4*d^4*x^4 + 12*A*B*a^
2*b^2*c^2*d^2 + 12*(2*A*B*b^4*c*d^3 + 2*A*B*a*b^3*d^4 + (B^2*b^4*c*d^3 - B^
2*a*b^3*d^4)*n)*x^3 + 6*(2*A*B*b^4*c^2*d^2 + 8*A*B*a*b^3*c*d^3 + 2*A*B*a^2*
b^2*d^4 + 3*(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*d^4)*n)*x^2 - (B^2*b^4*c^4 - 8*B
^2*a*b^3*c^3*d + 8*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n + 4*(6*A*B*a*b^3*c^2*d^
2 + 6*A*B*a^2*b^2*c*d^3 + (B^2*b^4*c^3*d + 6*B^2*a*b^3*c^2*d^2 - 6*B^2*a^2*
b^2*c*d^3 - B^2*a^3*b*d^4)*n)*x)*log((b*x + a)/(d*x + c)))*log(e) - 2*(12*A
^2*a^2*b^2*c^2*d^2 + 6*(5*B^2*b^4*d^4*n^2 + 2*A^2*b^4*d^4)*x^4 + 12*(2*A^2*
```

```
b^4*c*d^3 + 2*A^2*a*b^3*d^4 + 5*(B^2*b^4*c*d^3 + B^2*a*b^3*d^4)*n^2 + 2*(A*
B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 - (B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d - 1
6*B^2*a^3*b*c*d^3 + B^2*a^4*d^4)*n^2 + 6*(2*A^2*b^4*c^2*d^2 + 8*A^2*a*b^3*c
*d^3 + 2*A^2*a^2*b^2*d^4 + (7*B^2*b^4*c^2*d^2 + 16*B^2*a*b^3*c*d^3 + 7*B^2*
a^2*b^2*d^4)*n^2 + 6*(A*B*b^4*c^2*d^2 - A*B*a^2*b^2*d^4)*n)*x^2 - 2*(A*B*b^
4*c^4 - 8*A*B*a*b^3*c^3*d + 8*A*B*a^3*b*c*d^3 - A*B*a^4*d^4)*n + 4*(6*A^2*a
*b^3*c^2*d^2 + 6*A^2*a^2*b^2*c*d^3 + 3*(B^2*b^4*c^3*d + 4*B^2*a*b^3*c^2*d^2
 + 4*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n^2 + 2*(A*B*b^4*c^3*d + 6*A*B*a*b^
3*c^2*d^2 - 6*A*B*a^2*b^2*c*d^3 - A*B*a^3*b*d^4)*n)*x)*log((b*x + a)/(d*x +
 c)))/((b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2
*d^5 + 5*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*i^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6*
c^5*d^2 + 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d
^7)*g^3*i^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c
^4*d^3 - 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^
3*i^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*
c^3*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*i^3*x + (a^2*b^5*c^7 - 5*a^3*b^4
*c^6*d + 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^
2*d^5)*g^3*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(bgx+ag\right)^{3}\left(dix+ci\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^3*(d*i*x
+ c*i)^3), x)
```

3.209 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^3}\,dx$

Optimal. Leaf size=908

$$-\frac{2B^2n^2(c+dx)^3b^5}{27(bc-ad)^6g^4i^3(a+bx)^3}-\frac{(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2b^5}{3(bc-ad)^6g^4i^3(a+bx)^3}-\frac{2Bn(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^5}{9(bc-ad)^6g^4i^3(a+bx)^3}+\frac{5}{4(bc}$$

```
[Out] -(B^2*d^5*n^2*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (10*A*b*
B*d^4*n*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (10*b*B^2*d^4*n^2*(a
 + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (20*b^3*B^2*d^2*n^2*(c + d*x))
/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B^2*d*n^2*(c + d*x)^2)/(4*(b*c
- a*d)^6*g^4*i^3*(a + b*x)^2) - (2*b^5*B^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)
^6*g^4*i^3*(a + b*x)^3) - (10*b*B^2*d^4*n*(a + b*x)*Log[e*((a + b*x)/(c + d
*x))^n])/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (B*d^5*n*(a + b*x)^2*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (20*
b^3*B*d^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^
6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (2*b^5*B*n*(c + d*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^6*g^4*i^3*(a + b*x)
^3) - (d^5*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c -
a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2)/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x)*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^6*g^4*i^3*(a + b*x))
+ (5*b^4*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c -
a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^6*g^4*i^3*n)
```

Rubi [C] time = 10.511, antiderivative size = 2610, normalized size of antiderivative = 2.87, number of steps used = 195, number of rules used = 31, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.689, Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i + d*i*x)
^3),x]
```

```
[Out] (-2*b^2*B^2*n^2)/(27*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (37*b^2*B^2*d*n^2
)/(36*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (319*b^2*B^2*d^2*n^2)/(18*(b*c -
 a*d)^5*g^4*i^3*(a + b*x)) - (B^2*d^3*n^2)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*
x)^2) - (19*b*B^2*d^3*n^2)/(2*(b*c - a*d)^5*g^4*i^3*(c + d*x)) - (245*b^2*B
^2*d^3*n^2*Log[a + b*x])/(9*(b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B*d^3*n*Log[
a + b*x]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*n^2*Log[a + b*x]^2)/(
3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x)))
]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d
^3*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^6*g^4*i^3) -
 (2*b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^3*g^4*i^
3*(a + b*x)^3) + (11*b^2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*(
b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (47*b^2*B*d^2*n*(A + B*Log[e*((a + b*x)
```

```
/(c + d*x))^n]))/(3*(b*c - a*d)^5*g^4*i^3*(a + b*x)) + (B*d^3*n*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B
*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^3*(c +
d*x)) - (20*b^2*B*d^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(3*(b*c - a*d)^6*g^4*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2
)/(3*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (3*b^2*d*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2)/(2*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (6*b^2*d^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i^3*(a + b*x)) - (d^
3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^4*g^4*i^3*(c + d
*x)^2) - (4*b*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*
g^4*i^3*(c + d*x)) - (10*b^2*d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2)/((b*c - a*d)^6*g^4*i^3) + (245*b^2*B^2*d^3*n^2*Log[c + d*x])/(
9*(b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*n*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B^
2*d^3*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) + (20*b^2*B*
d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*(b*c - a*d)^6
*g^4*i^3) + (10*b^2*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*
x])/((b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B*d^3*n*Log[c + d*x]^2)/((b*c - a*d
)^6*g^4*i^3) + (10*b^2*B^2*d^3*n^2*Log[c + d*x]^2)/(3*(b*c - a*d)^6*g^4*i^3
) - (10*b^2*B^2*d^3*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^6*g^4*i^3
) + (10*b^2*B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c
- a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*n^2*Log[c + d*x]^3)/(3*(b*c - a*d)^6*g^
4*i^3) - (20*A*b^2*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b
*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(
b*c - a*d)])/(3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[(a + b*x)^n]^2
*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*
n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^6*g^4*i^3) -
(10*b^2*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^6*g^4*i^3)
 + (10*b^2*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)
/((b*c - a*d)^6*g^4*i^3) + (20*b^2*B^2*d^3*n*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(
c + d*x)^(-n)]))/((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*n*PolyLog[2, -((
d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*P
olyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*(b*c - a*d)^6*g^4*i^3) + (20*b^
2*B^2*d^3*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*
c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])/(3*(b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n*Log[(c + d*x)^(
-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) + (20*b
^2*B^2*d^3*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c +
d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3)
- (20*b^2*B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*
d)/(d*(a + b*x))])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*PolyLog[3,
 -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n
^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^6*g^4*i^3) - (20*b^2
*B^2*d^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^6*g^4*
i^3)
```

<u>Rule 2528</u>

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

<u>Rule 2525</u>

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
```

```
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
 h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c
 - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
 EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
```

```
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
```

```
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(209c+209dx)^3(ag+bgx)^4}\,dx = -\frac{2b^2B^2n^2}{246491883(bc-ad)^3g^4(a+bx)^3}+\frac{37b^2B^2dn^2}{328655844(bc-ad)^4g^4(a+bx)^2}-\frac{2}{14938902(}$$

Mathematica [B] time = 4.30853, size = 2138, normalized size = 2.35

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)^3),x]
```

```
[Out] -(360*b^2*B^2*d^3*n^2*(a + b*x)^3*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]^3 +
18*B*n*Log[(a + b*x)/(c + d*x)]^2*(60*a^3*A*b^2*c^2*d^3 + 2*b^5*B*c^5*n - 1
5*a*b^4*B*c^4*d*n + 60*a^2*b^3*B*c^3*d^2*n - 30*a^4*b*B*c*d^4*n + 3*a^5*B*d
^5*n + 180*a^2*A*b^3*c^2*d^3*x + 120*a^3*A*b^2*c*d^4*x - 5*b^5*B*c^4*d*n*x
+ 60*a*b^4*B*c^3*d^2*n*x + 180*a^2*b^3*B*c^2*d^3*n*x - 120*a^3*b^2*B*c*d^4*
n*x - 15*a^4*b*B*d^5*n*x + 180*a*A*b^4*c^2*d^3*x^2 + 360*a^2*A*b^3*c*d^4*x^
2 + 60*a^3*A*b^2*d^5*x^2 + 20*b^5*B*c^3*d^2*n*x^2 + 270*a*b^4*B*c^2*d^3*n*x
^2 - 90*a^3*b^2*B*d^5*n*x^2 + 60*A*b^5*c^2*d^3*x^3 + 360*a*A*b^4*c*d^4*x^3
+ 180*a^2*A*b^3*d^5*x^3 + 110*b^5*B*c^2*d^3*n*x^3 + 180*a*b^4*B*c*d^4*n*x^3
 - 90*a^2*b^3*B*d^5*n*x^3 + 120*A*b^5*c*d^4*x^4 + 180*a*A*b^4*d^5*x^4 + 100
*b^5*B*c*d^4*n*x^4 + 60*A*b^5*d^5*x^5 + 20*b^5*B*d^5*n*x^5 + 60*b^2*B*d^3*(
a + b*x)^3*(c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n] - 60*b^2*B*d^3*n*(a +
 b*x)^3*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]) + 6*b^2*d^2*(b*c - a*d)*(a +
b*x)^2*(c + d*x)^2*(108*A^2 + 282*A*B*n + 319*B^2*n^2 + 108*B^2*Log[e*((a +
 b*x)/(c + d*x))^n]^2 - 6*B*n*(36*A + 47*B*n)*Log[(a + b*x)/(c + d*x)] + 10
8*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(
36*A + 47*B*n - 36*B*n*Log[(a + b*x)/(c + d*x)])) - 3*b^2*d*(b*c - a*d)^2*(
a + b*x)*(c + d*x)^2*(54*A^2 + 66*A*B*n + 37*B^2*n^2 + 54*B^2*Log[e*((a + b
*x)/(c + d*x))^n]^2 - 6*B*n*(18*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 54*B
^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(18*
A + 11*B*n - 18*B*n*Log[(a + b*x)/(c + d*x)])) + 4*b^2*(b*c - a*d)^3*(c + d
*x)^2*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2
 - 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*Log[(a + b*x)/(c
+ d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a +
b*x)/(c + d*x)])) + 60*b^2*d^3*(a + b*x)^3*(c + d*x)^2*Log[a + b*x]*(18*A^2
 + 12*A*B*n + 49*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 12*B*n
*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]
^2 + 12*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a + b*x)/(
c + d*x)])) + 27*d^3*(b*c - a*d)^2*(a + b*x)^3*(2*A^2 - 2*A*B*n + B^2*n^2 +
 2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/
(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c
 + d*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*x)])) + 54*b*d^3*(b*c
- a*d)*(a + b*x)^3*(c + d*x)*(8*A^2 - 18*A*B*n + 19*B^2*n^2 + 8*B^2*Log[e*(
(a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-8*A + 9*B*n)*Log[(a + b*x)/(c + d*x)] +
 8*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*
(-8*A + 9*B*n + 8*B*n*Log[(a + b*x)/(c + d*x)])) + 6*B*(b*c - a*d)*n*Log[(a
 + b*x)/(c + d*x)]*(18*b*d^3*(a + b*x)^3*(c + d*x)*(8*A - 9*B*n + 8*B*Log[e
*((a + b*x)/(c + d*x))^n] - 8*B*n*Log[(a + b*x)/(c + d*x)]) + 4*b^2*(b*c -
a*d)^2*(c + d*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n] - 3*B*n*
Log[(a + b*x)/(c + d*x)]) + 9*d^3*(b*c - a*d)*(a + b*x)^3*(2*A - B*n + 2*B*
Log[e*((a + b*x)/(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c + d*x)]) - 3*b^2*d*
(b*c - a*d)*(a + b*x)*(c + d*x)^2*(18*A + 11*B*n + 18*B*(Log[e*((a + b*x)/(
c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])) + 6*b^2*d^2*(a + b*x)^2*(c + d*
x)^2*(36*A + 47*B*n + 36*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x
)/(c + d*x)]))) - 60*b^2*d^3*(a + b*x)^3*(c + d*x)^2*(18*A^2 + 12*A*B*n + 4
9*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 12*B*n*(3*A + B*n)*Lo
g[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 12*B*Log[e
*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a + b*x)/(c + d*x)]))*Log
[c + d*x])/(108*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3*(c + d*x)^2)
```

Maple [F] time = 0.727, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}\left(dix+ci\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)

[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

Maxima [B] time = 6.42509, size = 12546, normalized size = 13.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x,
 algorithm="maxima")

[Out] -1/6*B^2*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2
 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*
b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^
3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*
d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d
^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a
^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4
*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3
 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^
4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c
^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g
^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^
5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*
x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^
3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*x + a)/((b^6
*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2
*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d*x + c)/((b^
6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^
2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(e*(b*x/(d*x + c) + a/(d*
x + c))^n)^2 - 1/3*A*B*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a
^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4
)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c
^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2
- 5*a*b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d
^6 - a^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*
c^4*d^3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^
6*b^2*d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a
^3*b^5*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3
*a^7*b*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2
+ 25*a^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^
6 - a^8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c
^5*d^2 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c
*d^6)*g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*
a^6*b^2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(
b*x + a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^
3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log
(d*x + c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d
^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(e*(b*x/(d*
x + c) + a/(d*x + c))^n) - 1/108*((8*b^5*c^5 - 135*a*b^4*c^4*d + 2160*a^2*b
^3*c^3*d^2 - 980*a^3*b^2*c^2*d^3 - 1080*a^4*b*c*d^4 + 27*a^5*d^5 + 2940*(b^
5*c*d^4 - a*b^4*d^5)*x^4 + 30*(159*b^5*c^2*d^3 + 74*a*b^4*c*d^4 - 233*a^2*b
^3*d^5)*x^3 + 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d
^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*
d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c
```

*d^4)*x)*log(b*x + a)^3 - 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(d*x + c)^3 + 10*(170*b^5*c^3*d^2 + 921*a*b^4*c^2*d^3 - 588*a^2*b^3*c*d^4 - 503*a^3*b^2*d^5)*x^2 - 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 360*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x + c)^2 - 5*(19*b^5*c^4*d - 756*a*b^4*c^3*d^2 - 708*a^2*b^3*c^2*d^3 + 1256*a^3*b^2*c*d^4 + 189*a^4*b*d^5)*x + 2940*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a) - 60*(49*b^5*d^5*x^5 + 49*a^3*b^2*c^2*d^3 + 49*(2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + 49*(b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + 49*(3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + 18*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 + 49*(3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 12*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a))*log(d*x + c))*n^2/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x) + 6*(4*b^5*c^5 - 45*a*b^4*c^4*d + 360*a^2*b^3*c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4 - 9*a^5*d^5 + 120*(b^5*c*d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^4*c*d^4 - a^2*b^3*d^5)*x^3 + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2*b^3*c*d^4 + 7*a^3*b^2*d^5)*x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(d*x + c)^2 - 5*(5*b^5*c^4*d - 108*a*b^4*c^3*d^2 + 78*a^2*b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x + 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)

```
*x)*log(b*x + a) - 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*
b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4
*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*
b^2*c*d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^
5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d
^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*
d^4)*x)*log(b*x + a))*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
)/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i
^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*
d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*
g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*
b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 +
(2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3
 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*
d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*
c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*
a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g
^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8
*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b
^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^
3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*
i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^
5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*
a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x))*B^2 - 1/18*(4*b^5*c^5 - 45
*a*b^4*c^4*d + 360*a^2*b^3*c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4
 - 9*a^5*d^5 + 120*(b^5*c*d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^
4*c*d^4 - a^2*b^3*d^5)*x^3 + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2
*b^3*c*d^4 + 7*a^3*b^2*d^5)*x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b
^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)
*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c
^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^
2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*
a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 +
(3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*log(d*x + c)^2 - 5*(5*b^5*c^4*d -
108*a*b^4*c^3*d^2 + 78*a^2*b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x
 + 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (
b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2
*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*lo
g(b*x + a) - 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^
5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d
^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*
d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4
 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6
*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x
)*log(b*x + a))*log(d*x + c))*A*B*n/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*
g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*
b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*
c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20
*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4
*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^
4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5
*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 +
3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3
+ 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*
d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8
*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*
a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g
^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*
g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b
```

```
^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3
 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i
^3)*x) - 1/6*A^2*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2
*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3
+ 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d -
 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*
b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a
^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^
3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*
d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5
*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b
*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a
^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^
8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2
 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*
g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^
2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*log(b*x +
a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15
*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d*x +
 c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 1
5*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))
```

Fricas [B] time = 1.04947, size = 9756, normalized size = 10.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x,
 algorithm="fricas")
```

```
[Out] -1/108*(36*A^2*b^5*c^5 - 270*A^2*a*b^4*c^4*d + 1080*A^2*a^2*b^3*c^3*d^2 - 3
60*A^2*a^3*b^2*c^2*d^3 - 540*A^2*a^4*b*c*d^4 + 54*A^2*a^5*d^5 + 60*(18*A^2*
b^5*c*d^4 - 18*A^2*a*b^4*d^5 + 49*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*n^2 + 12*
(A*B*b^5*c*d^4 - A*B*a*b^4*d^5)*n)*x^4 + 30*(54*A^2*b^5*c^2*d^3 + 36*A^2*a*
b^4*c*d^4 - 90*A^2*a^2*b^3*d^5 + (159*B^2*b^5*c^2*d^3 + 74*B^2*a*b^4*c*d^4
- 233*B^2*a^2*b^3*d^5)*n^2 + 24*(3*A*B*b^5*c^2*d^3 - 2*A*B*a*b^4*c*d^4 - A*
B*a^2*b^3*d^5)*n)*x^3 + 360*(B^2*b^5*d^5*n^2*x^5 + B^2*a^3*b^2*c^2*d^3*n^2
+ (2*B^2*b^5*c*d^4 + 3*B^2*a*b^4*d^5)*n^2*x^4 + (B^2*b^5*c^2*d^3 + 6*B^2*a*
b^4*c*d^4 + 3*B^2*a^2*b^3*d^5)*n^2*x^3 + (3*B^2*a*b^4*c^2*d^3 + 6*B^2*a^2*b
^3*c*d^4 + B^2*a^3*b^2*d^5)*n^2*x^2 + (3*B^2*a^2*b^3*c^2*d^3 + 2*B^2*a^3*b^
2*c*d^4)*n^2*x)*log((b*x + a)/(d*x + c))^3 + (8*B^2*b^5*c^5 - 135*B^2*a*b^4
*c^4*d + 2160*B^2*a^2*b^3*c^3*d^2 - 980*B^2*a^3*b^2*c^2*d^3 - 1080*B^2*a^4*
b*c*d^4 + 27*B^2*a^5*d^5)*n^2 + 10*(36*A^2*b^5*c^3*d^2 + 378*A^2*a*b^4*c^2*
d^3 - 216*A^2*a^2*b^3*c*d^4 - 198*A^2*a^3*b^2*d^5 + (170*B^2*b^5*c^3*d^2 +
921*B^2*a*b^4*c^2*d^3 - 588*B^2*a^2*b^3*c*d^4 - 503*B^2*a^3*b^2*d^5)*n^2 +
12*(11*A*B*b^5*c^3*d^2 + 21*A*B*a*b^4*c^2*d^3 - 39*A*B*a^2*b^3*c*d^4 + 7*A*
B*a^3*b^2*d^5)*n)*x^2 + 18*(2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2
*b^3*c^3*d^2 - 20*B^2*a^3*b^2*c^2*d^3 - 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5
+ 60*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*x^4 + 30*(3*B^2*b^5*c^2*d^3 + 2*B^2*a*
b^4*c*d^4 - 5*B^2*a^2*b^3*d^5)*x^3 + 10*(2*B^2*b^5*c^3*d^2 + 21*B^2*a*b^4*c
^2*d^3 - 12*B^2*a^2*b^3*c*d^4 - 11*B^2*a^3*b^2*d^5)*x^2 - 5*(B^2*b^5*c^4*d
- 12*B^2*a*b^4*c^3*d^2 - 24*B^2*a^2*b^3*c^2*d^3 + 32*B^2*a^3*b^2*c*d^4 + 3*
B^2*a^4*b*d^5)*x + 60*(B^2*b^5*d^5*x^5 + B^2*a^3*b^2*c^2*d^3 + (2*B^2*b^5*c
*d^4 + 3*B^2*a*b^4*d^5)*x^4 + (B^2*b^5*c^2*d^3 + 6*B^2*a*b^4*c*d^4 + 3*B^2*
a^2*b^3*d^5)*x^3 + (3*B^2*a*b^4*c^2*d^3 + 6*B^2*a^2*b^3*c*d^4 + B^2*a^3*b^2
*d^5)*x^2 + (3*B^2*a^2*b^3*c^2*d^3 + 2*B^2*a^3*b^2*c*d^4)*x)*log((b*x + a)/
```

```
(d*x + c)))*log(e)^2 + 18*(60*A*B*a^3*b^2*c^2*d^3*n + 20*(B^2*b^5*d^5*n^2 +
 3*A*B*b^5*d^5*n)*x^5 + 20*(5*B^2*b^5*c*d^4*n^2 + 3*(2*A*B*b^5*c*d^4 + 3*A*
B*a*b^4*d^5)*n)*x^4 + 10*((11*B^2*b^5*c^2*d^3 + 18*B^2*a*b^4*c*d^4 - 9*B^2*
a^2*b^3*d^5)*n^2 + 6*(A*B*b^5*c^2*d^3 + 6*A*B*a*b^4*c*d^4 + 3*A*B*a^2*b^3*d
^5)*n)*x^3 + (2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2*b^3*c^3*d^2 -
 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5)*n^2 + 10*((2*B^2*b^5*c^3*d^2 + 27*B^2*
a*b^4*c^2*d^3 - 9*B^2*a^3*b^2*d^5)*n^2 + 6*(3*A*B*a*b^4*c^2*d^3 + 6*A*B*a^2
*b^3*c*d^4 + A*B*a^3*b^2*d^5)*n)*x^2 - 5*((B^2*b^5*c^4*d - 12*B^2*a*b^4*c^3
*d^2 - 36*B^2*a^2*b^3*c^2*d^3 + 24*B^2*a^3*b^2*c*d^4 + 3*B^2*a^4*b*d^5)*n^2
 - 12*(3*A*B*a^2*b^3*c^2*d^3 + 2*A*B*a^3*b^2*c*d^4)*n)*x)*log((b*x + a)/(d*
x + c))^2 + 6*(4*A*B*b^5*c^5 - 45*A*B*a*b^4*c^4*d + 360*A*B*a^2*b^3*c^3*d^2
 - 490*A*B*a^3*b^2*c^2*d^3 + 180*A*B*a^4*b*c*d^4 - 9*A*B*a^5*d^5)*n - 5*(18
*A^2*b^5*c^4*d - 216*A^2*a*b^4*c^3*d^2 - 432*A^2*a^2*b^3*c^2*d^3 + 576*A^2*
a^3*b^2*c*d^4 + 54*A^2*a^4*b*d^5 + (19*B^2*b^5*c^4*d - 756*B^2*a*b^4*c^3*d^
2 - 708*B^2*a^2*b^3*c^2*d^3 + 1256*B^2*a^3*b^2*c*d^4 + 189*B^2*a^4*b*d^5)*n
^2 + 6*(5*A*B*b^5*c^4*d - 108*A*B*a*b^4*c^3*d^2 + 78*A*B*a^2*b^3*c^2*d^3 +
52*A*B*a^3*b^2*c*d^4 - 27*A*B*a^4*b*d^5)*n)*x + 6*(12*A*B*b^5*c^5 - 90*A*B*
a*b^4*c^4*d + 360*A*B*a^2*b^3*c^3*d^2 - 120*A*B*a^3*b^2*c^2*d^3 - 180*A*B*a
^4*b*c*d^4 + 18*A*B*a^5*d^5 + 120*(3*A*B*b^5*c*d^4 - 3*A*B*a*b^4*d^5 + (B^2
*b^5*c*d^4 - B^2*a*b^4*d^5)*n)*x^4 + 60*(9*A*B*b^5*c^2*d^3 + 6*A*B*a*b^4*c*
d^4 - 15*A*B*a^2*b^3*d^5 + 2*(3*B^2*b^5*c^2*d^3 - 2*B^2*a*b^4*c*d^4 - B^2*a
^2*b^3*d^5)*n)*x^3 + 20*(6*A*B*b^5*c^3*d^2 + 63*A*B*a*b^4*c^2*d^3 - 36*A*B*
a^2*b^3*c*d^4 - 33*A*B*a^3*b^2*d^5 + (11*B^2*b^5*c^3*d^2 + 21*B^2*a*b^4*c^2
*d^3 - 39*B^2*a^2*b^3*c*d^4 + 7*B^2*a^3*b^2*d^5)*n)*x^2 + 180*(B^2*b^5*d^5*
n*x^5 + B^2*a^3*b^2*c^2*d^3*n + (2*B^2*b^5*c*d^4 + 3*B^2*a*b^4*d^5)*n*x^4 +
 (B^2*b^5*c^2*d^3 + 6*B^2*a*b^4*c*d^4 + 3*B^2*a^2*b^3*d^5)*n*x^3 + (3*B^2*a
*b^4*c^2*d^3 + 6*B^2*a^2*b^3*c*d^4 + B^2*a^3*b^2*d^5)*n*x^2 + (3*B^2*a^2*b^
3*c^2*d^3 + 2*B^2*a^3*b^2*c*d^4)*n*x)*log((b*x + a)/(d*x + c))^2 + (4*B^2*b
^5*c^5 - 45*B^2*a*b^4*c^4*d + 360*B^2*a^2*b^3*c^3*d^2 - 490*B^2*a^3*b^2*c^2
*d^3 + 180*B^2*a^4*b*c*d^4 - 9*B^2*a^5*d^5)*n - 5*(6*A*B*b^5*c^4*d - 72*A*B
*a*b^4*c^3*d^2 - 144*A*B*a^2*b^3*c^2*d^3 + 192*A*B*a^3*b^2*c*d^4 + 18*A*B*a
^4*b*d^5 + (5*B^2*b^5*c^4*d - 108*B^2*a*b^4*c^3*d^2 + 78*B^2*a^2*b^3*c^2*d^
3 + 52*B^2*a^3*b^2*c*d^4 - 27*B^2*a^4*b*d^5)*n)*x + 6*(60*A*B*a^3*b^2*c^2*d
^3 + 20*(B^2*b^5*d^5*n + 3*A*B*b^5*d^5)*x^5 + 20*(5*B^2*b^5*c*d^4*n + 6*A*B
*b^5*c*d^4 + 9*A*B*a*b^4*d^5)*x^4 + 10*(6*A*B*b^5*c^2*d^3 + 36*A*B*a*b^4*c*
d^4 + 18*A*B*a^2*b^3*d^5 + (11*B^2*b^5*c^2*d^3 + 18*B^2*a*b^4*c*d^4 - 9*B^2
*a^2*b^3*d^5)*n)*x^3 + 10*(18*A*B*a*b^4*c^2*d^3 + 36*A*B*a^2*b^3*c*d^4 + 6*
A*B*a^3*b^2*d^5 + (2*B^2*b^5*c^3*d^2 + 27*B^2*a*b^4*c^2*d^3 - 9*B^2*a^3*b^2
*d^5)*n)*x^2 + (2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2*b^3*c^3*d^2
 - 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5)*n + 5*(36*A*B*a^2*b^3*c^2*d^3 + 24*A
*B*a^3*b^2*c*d^4 - (B^2*b^5*c^4*d - 12*B^2*a*b^4*c^3*d^2 - 36*B^2*a^2*b^3*c
^2*d^3 + 24*B^2*a^3*b^2*c*d^4 + 3*B^2*a^4*b*d^5)*n)*x)*log((b*x + a)/(d*x +
 c)))*log(e) + 6*(180*A^2*a^3*b^2*c^2*d^3 + 10*(49*B^2*b^5*d^5*n^2 + 12*A*B
*b^5*d^5*n + 18*A^2*b^5*d^5)*x^5 + 10*(60*A*B*b^5*c*d^4*n + 36*A^2*b^5*c*d^
4 + 54*A^2*a*b^4*d^5 + 5*(22*B^2*b^5*c*d^4 + 27*B^2*a*b^4*d^5)*n^2)*x^4 + 1
0*(18*A^2*b^5*c^2*d^3 + 108*A^2*a*b^4*c*d^4 + 54*A^2*a^2*b^3*d^5 + 5*(17*B^
2*b^5*c^2*d^3 + 54*B^2*a*b^4*c*d^4 + 27*B^2*a^2*b^3*d^5)*n^2 + 6*(11*A*B*b^
5*c^2*d^3 + 18*A*B*a*b^4*c*d^4 - 9*A*B*a^2*b^3*d^5)*n)*x^3 + (4*B^2*b^5*c^5
 - 45*B^2*a*b^4*c^4*d + 360*B^2*a^2*b^3*c^3*d^2 + 180*B^2*a^4*b*c*d^4 - 9*B
^2*a^5*d^5)*n^2 + 10*(54*A^2*a*b^4*c^2*d^3 + 108*A^2*a^2*b^3*c*d^4 + 18*A^2
*a^3*b^2*d^5 + (22*B^2*b^5*c^3*d^2 + 189*B^2*a*b^4*c^2*d^3 + 216*B^2*a^2*b^
3*c*d^4 + 63*B^2*a^3*b^2*d^5)*n^2 + 6*(2*A*B*b^5*c^3*d^2 + 27*A*B*a*b^4*c^2
*d^3 - 9*A*B*a^3*b^2*d^5)*n)*x^2 + 6*(2*A*B*b^5*c^5 - 15*A*B*a*b^4*c^4*d +
60*A*B*a^2*b^3*c^3*d^2 - 30*A*B*a^4*b*c*d^4 + 3*A*B*a^5*d^5)*n + 5*(108*A^2
*a^2*b^3*c^2*d^3 + 72*A^2*a^3*b^2*c*d^4 - (5*B^2*b^5*c^4*d - 108*B^2*a*b^4*
c^3*d^2 - 216*B^2*a^2*b^3*c^2*d^3 - 144*B^2*a^3*b^2*c*d^4 - 27*B^2*a^4*b*d^
5)*n^2 - 6*(A*B*b^5*c^4*d - 12*A*B*a*b^4*c^3*d^2 - 36*A*B*a^2*b^3*c^2*d^3 +
 24*A*B*a^3*b^2*c*d^4 + 3*A*B*a^4*b*d^5)*n)*x)*log((b*x + a)/(d*x + c)))/((
b^9*c^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 1
```

```
5*a^4*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 + a^6*b^3*d^8)*g^4*i^3*x^5 + (2*b^9*c^7
*d - 9*a*b^8*c^6*d^2 + 12*a^2*b^7*c^5*d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*
c^3*d^5 + 33*a^5*b^4*c^2*d^6 - 16*a^6*b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*i^3*x^
4 + (b^9*c^8 - 18*a^2*b^7*c^6*d^2 + 52*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4
 + 24*a^5*b^4*c^3*d^5 + 10*a^6*b^3*c^2*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8
)*g^4*i^3*x^3 + (3*a*b^8*c^8 - 12*a^2*b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a
^4*b^5*c^5*d^3 - 60*a^5*b^4*c^4*d^4 + 52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d
^6 + a^9*d^8)*g^4*i^3*x^2 + (3*a^2*b^7*c^8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*
c^6*d^2 - 30*a^5*b^4*c^5*d^3 + 5*a^6*b^3*c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a
^8*b*c^2*d^6 + 2*a^9*c*d^7)*g^4*i^3*x + (a^3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15
*a^5*b^4*c^6*d^2 - 20*a^6*b^3*c^5*d^3 + 15*a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^
5 + a^9*c^2*d^6)*g^4*i^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(bgx+ag\right)^{4}(dix+ci)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x,
 algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^4*(d*i*x
+ c*i)^3), x)
```

3.210 $\int (ag+bgx)^m (ci+dix)^{-2-m} \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p \, dx$

Optimal. Leaf size=189

$$\frac{(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^p\left(-\frac{(m+1)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{Bn}\right)^{-p}\text{Gamma}}{i^2(m+1)(c+dx)(bc-ad)}$$

```
[Out] ((a + b*x)*(g*(a + b*x))^m*Gamma[1 + p, -(((1 + m)*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(B*n))]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^p)/((b*c - a
*d)*E^((A*(1 + m))/(B*n))*i^2*(1 + m)*(e*((a + b*x)/(c + d*x))^n)^((1 + m)/
n)*(c + d*x)*(i*(c + d*x))^m*(-(((1 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(B*n)))^p)
```

Rubi [F] time = 0.975122, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int (ag+bgx)^m (ci+dix)^{-2-m} \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^p,x]
```

```
[Out] Defer[Int][(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^p, x]
```

Rubi steps

$$\int (210c+210dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p dx = \int (210c+210dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a-}{c-}\right.\right.\right.$$

Mathematica [F] time = 0.537676, size = 0, normalized size = 0.

$$\int (ag+bgx)^m (ci+dix)^{-2-m} \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p, x]
```

Maple [F] time = 3.169, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{m} \left(dix+ci\right)^{-2-m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{p}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{m} (dix+ci)^{-m-2} \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{p}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(bgx+ag\right)^{m} (dix+ci)^{-m-2} \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{p}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log(e*((b*x + a)/(d*x +
c))^n) + A)^p, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**p,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-m-2} \left(B \log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^p, x)
```

3.211 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p dx$

Optimal. Leaf size=190

$$-\frac{(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^p\left(\frac{(m+1)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{Bn}\right)^{-p}\text{Gan}}{i^2(m+1)(c+dx)(bc-ad)}$$

```
[Out] -((E^((A*(1 + m))/(B*n))*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a + b*x)/(c
+ d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*Gamma[1 + p, ((1 + m)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n]))/(B*n)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^p)/((b*c - a*d)*i^2*(1 + m)*(c + d*x)*(((1 + m)*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(B*n))^p))
```

Rubi [F] time = 0.884281, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^p,x]
```

```
[Out] Defer[Int][(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])^p, x]
```

Rubi steps

$$\int (211c+211dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p dx = \int (211c+211dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\right.\right.\right.$$

Mathematica [F] time = 0.507904, size = 0, normalized size = 0.

$$\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^p dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^p, x]
```

Maple [F] time = 2.14, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m} (dix+ci)^{m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{p} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-m-2} (dix+ci)^{m} \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{p} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bgx+ag\right)^{-m-2}(dix+ci)^{m}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{p}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log(e*((b*x + a)/(d*x +
c))^n) + A)^p, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**p,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-m-2}(dix+ci)^m\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^p, x)
```

3.212 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3\,dx$

Optimal. Leaf size=292

$$\frac{6B^2n^2(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)^3(c+dx)(bc-ad)}+\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}{i^2(m+1)(c+dx)(bc-ad)}$$

```
[Out] (-6*B^3*n^3*(a + b*x)*(g*(a + b*x))^m)/((b*c - a*d)*i^2*(1 + m)^4*(c + d*x)
*(i*(c + d*x))^m) + (6*B^2*n^2*(a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/((b*c - a*d)*i^2*(1 + m)^3*(c + d*x)*(i*(c + d*x))^m)
 - (3*B*n*(a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2)/((b*c - a*d)*i^2*(1 + m)^2*(c + d*x)*(i*(c + d*x))^m) + ((a + b*x)*(g*(a
 + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/((b*c - a*d)*i^2*(1 +
m)*(c + d*x)*(i*(c + d*x))^m)
```

Rubi [F] time = 1.97695, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^3,x]
```

```
[Out] (A^3*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m))/((b*c - a*d)*g*i*(1 + m)
) - (3*A^2*B*n*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m))/((b*c - a*d)*g
*i*(1 + m)^2) + (3*A^2*B*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m)*Log[e
*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i*(1 + m)) + 3*A*B^2*Defer[Int][(
a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*Log[e*((a + b*x)/(c + d*x))^n]^2, x]
+ B^3*Defer[Int][(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*Log[e*((a + b*x)/(c
 + d*x))^n]^3, x]
```

Rubi steps

$$\int (212c+212dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3\,dx=\int \left(A^3(212c+212dx)^{-2-m}(ag+bgx)^m+3A^2B(212c\right.$$

$$=A^3\int (212c+212dx)^{-2-m}(ag+bgx)^m\,dx+\left(3A^2B\right)$$

$$=\frac{A^3(212c+212dx)^{-1-m}(ag+bgx)^{1+m}}{212(bc-ad)g(1+m)}+\frac{3A^2B(212c}{}$$

$$=\frac{A^3(212c+212dx)^{-1-m}(ag+bgx)^{1+m}}{212(bc-ad)g(1+m)}+\frac{3A^2B(212c}{}$$

$$=-\frac{3\;212^{-2-m}A^2Bn(c+dx)^{-1-m}(ag+bgx)^{1+m}}{(bc-ad)g(1+m)^2}+\frac{A^3(2}{}$$

Mathematica [A] time = 7.57979, size = 206, normalized size = 0.71

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m-1}\left(3B(m+1)\left(A^2(m+1)^2-2AB(m+1)n+2B^2n^2\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3B^2(m+1)^2(\cdots}{i(m+1\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^3,x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*(i*(c + d*x))^(-1 - m)*(A^3*(1 + m)^3 - 3*A^2*B*
(1 + m)^2*n + 6*A*B^2*(1 + m)*n^2 - 6*B^3*n^3 + 3*B*(1 + m)*(A^2*(1 + m)^2
- 2*A*B*(1 + m)*n + 2*B^2*n^2)*Log[e*((a + b*x)/(c + d*x))^n] + 3*B^2*(1 +
m)^2*(A + A*m - B*n)*Log[e*((a + b*x)/(c + d*x))^n]^2 + B^3*(1 + m)^3*Log[e
*((a + b*x)/(c + d*x))^n]^3))/((b*c - a*d)*i*(1 + m)^4)
```

Maple [F] time = 5.497, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{m}(dix+ci)^{-2-m}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{3}\left(bgx+ag\right)^{m}(dix+ci)^{-m-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^3*(b*g*x + a*g)^m*(d*i*x +
 c*i)^(-m - 2), x)
```

Fricas [B] time = 0.82571, size = 5800, normalized size = 19.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] (A^3*a*c*m^3 - 6*B^3*a*c*n^3 + 3*A^3*a*c*m^2 + 3*A^3*a*c*m + A^3*a*c + (B^3
*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c + (B^3*b*d*m^3 + 3*B^3*b*d
*m^2 + 3*B^3*b*d*m + B^3*b*d)*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d
)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*x)*log(e)^3 +
((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^3*x^2 + (B^3*b*c +
 B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c
 + B^3*a*d)*m)*n^3*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c
)*n^3)*log((b*x + a)/(d*x + c))^3 + 6*(A*B^2*a*c*m + A*B^2*a*c)*n^2 + (A^3*
b*d*m^3 - 6*B^3*b*d*n^3 + 3*A^3*b*d*m^2 + 3*A^3*b*d*m + A^3*b*d + 6*(A*B^2*
b*d*m + A*B^2*b*d)*n^2 - 3*(A^2*B*b*d*m^2 + 2*A^2*B*b*d*m + A^2*B*b*d)*n)*x
^2 + 3*(A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c + (A*B^
2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d - (B^3*b*d*m^2 + 2*
B^3*b*d*m + B^3*b*d)*n)*x^2 - (B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n + (A*
B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*
d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m - (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*
a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n)*x + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 +
3*B^3*b*d*m + B^3*b*d)*n*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3
 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*n*x + (B^3*a*c*m^3
+ 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n)*log((b*x + a)/(d*x + c)))*log(e
)^2 - 3*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^3 - (A*B^2*a*c*m^3 + 3*A*B
^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m +
 B^3*b*d)*n^3 - (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*
d)*n^2)*x^2 + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c +
B^3*a*d)*m)*n^3 - (A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*
(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m)*n^2)*x)*log((b*x
 + a)/(d*x + c))^2 - 3*(A^2*B*a*c*m^2 + 2*A^2*B*a*c*m + A^2*B*a*c)*n + (A^3
*b*c + A^3*a*d + (A^3*b*c + A^3*a*d)*m^3 - 6*(B^3*b*c + B^3*a*d)*n^3 + 3*(A
^3*b*c + A^3*a*d)*m^2 + 6*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*
m)*n^2 + 3*(A^3*b*c + A^3*a*d)*m - 3*(A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c +
A^2*B*a*d)*m^2 + 2*(A^2*B*b*c + A^2*B*a*d)*m)*n)*x + 3*(A^2*B*a*c*m^3 + 3*A
^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c + 2*(B^3*a*c*m + B^3*a*c)*n^2 + (A
^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d + 2*(B^3*b*d*m +
 B^3*b*d)*n^2 - 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 + ((B^
3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^2*x^2 + (B^3*b*c + B^3
*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B
^3*a*d)*m)*n^2*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n^
2)*log((b*x + a)/(d*x + c))^2 - 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a*
c)*n + (A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c
+ A^2*B*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^2 + 3*(A
^2*B*b*c + A^2*B*a*d)*m - 2*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d
)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n)*x - 2*((B^3*a*c*m^2 + 2*B^3*a*c*m +
 B^3*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^2 - (A*B^2*b*d*m^3
 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 - (A*B^2*a*c*m^3 + 3
*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n + ((B^3*b*c + B^3*a*d + (B^3*
b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n^2 - (A*B^2*b*c + A*B^2*a*d
+ (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*
c + A*B^2*a*d)*m)*n)*x)*log((b*x + a)/(d*x + c)))*log(e) + 3*(2*(B^3*a*c*m
+ B^3*a*c)*n^3 - 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a*c)*n^2 + (2*(B^
3*b*d*m + B^3*b*d)*n^3 - 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n^2
+ (A^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d)*n)*x^2 + (A
^2*B*a*c*m^3 + 3*A^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c)*n + (2*(B^3*b*c
 + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^3 - 2*(A*B^2*b*c + A*B^2*a*d + (A*B^2
*b*c + A*B^2*a*d)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n^2 + (A^2*B*b*c + A^2
*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c + A^2*B*a*d)*m^2 + 3*(A
^2*B*b*c + A^2*B*a*d)*m)*n)*x)*log((b*x + a)/(d*x + c)))*(b*g*x + a*g)^m*e^
(-(m + 2)*log(b*g*x + a*g) + (m + 2)*log((b*x + a)/(d*x + c)) - (m + 2)*log
(i/g))/((b*c - a*d)*m^4 + 4*(b*c - a*d)*m^3 + 6*(b*c - a*d)*m^2 + b*c - a*d
 + 4*(b*c - a*d)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{3}\left(bgx+ag\right)^{m}(dix+ci)^{-m-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^3*(b*g*x + a*g)^m*(d*i*x +
 c*i)^(-m - 2), x)
```

3.213 $\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=210

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(m+1)(c+dx)(bc-ad)}-\frac{2Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}{i^2(m+1)^2(c+dx)(bc-ad)}$$

```
[Out] (2*B^2*n^2*(a + b*x)*(g*(a + b*x))^m)/((b*c - a*d)*i^2*(1 + m)^3*(c + d*x)*
(i*(c + d*x))^m) - (2*B*n*(a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]))/((b*c - a*d)*i^2*(1 + m)^2*(c + d*x)*(i*(c + d*x))^m) + ((
a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c -
a*d)*i^2*(1 + m)*(c + d*x)*(i*(c + d*x))^m)
```

Rubi [F] time = 1.21513, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int (ag+bgx)^m(ci+dix)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2,x]
```

```
[Out] (A^2*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m))/((b*c - a*d)*g*i*(1 + m)
) - (2*A*B*n*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m))/((b*c - a*d)*g*i
*(1 + m)^2) + (2*A*B*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m)*Log[e*((a
 + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i*(1 + m)) + B^2*Defer[Int][(a*g + b*
g*x)^m*(c*i + d*i*x)^(-2 - m)*Log[e*((a + b*x)/(c + d*x))^n]^2, x]
```

Rubi steps

$$\int (213c+213dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx=\int\left(A^2(213c+213dx)^{-2-m}(ag+bgx)^m+2AB(213c\right.$$
$$=A^2\int(213c+213dx)^{-2-m}(ag+bgx)^m\,dx+(2AB)\int$$
$$=\frac{A^2(213c+213dx)^{-1-m}(ag+bgx)^{1+m}}{213(bc-ad)g(1+m)}+\frac{2AB(213c+}{}$$
$$=\frac{A^2(213c+213dx)^{-1-m}(ag+bgx)^{1+m}}{213(bc-ad)g(1+m)}+\frac{2AB(213c+}{}$$
$$=-\frac{2\ 213^{-2-m}ABn(c+dx)^{-1-m}(ag+bgx)^{1+m}}{(bc-ad)g(1+m)^2}+\frac{A^2(21}{}$$

Mathematica [A] time = 2.07189, size = 134, normalized size = 0.64

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m-1}\left(2B(m+1)(Am+A-Bn)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B^2(m+1)^2\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A^2(m+1\right.}{i(m+1)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2,x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*(i*(c + d*x))^(-1 - m)*(A^2*(1 + m)^2 - 2*A*B*(1
 + m)*n + 2*B^2*n^2 + 2*B*(1 + m)*(A + A*m - B*n)*Log[e*((a + b*x)/(c + d*x
))^n] + B^2*(1 + m)^2*Log[e*((a + b*x)/(c + d*x))^n]^2))/((b*c - a*d)*i*(1
+ m)^3)
```

Maple [F] time = 4.484, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{m} \left(dix+ci\right)^{-2-m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2} \left(bgx+ag\right)^{m} \left(dix+ci\right)^{-m-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^m*(d*i*x +
 c*i)^(-m - 2), x)
```

Fricas [B] time = 0.651262, size = 2201, normalized size = 10.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] (A^2*a*c*m^2 + 2*B^2*a*c*n^2 + 2*A^2*a*c*m + A^2*a*c + (A^2*b*d*m^2 + 2*B^2
*b*d*n^2 + 2*A^2*b*d*m + A^2*b*d - 2*(A*B*b*d*m + A*B*b*d)*n)*x^2 + (B^2*a*
c*m^2 + 2*B^2*a*c*m + B^2*a*c + (B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*x^2 +
 (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*x)
*log(e)^2 + ((B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*n^2*x^2 + (B^2*b*c + B^2
*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*n^2*x + (B^2*a*c*
m^2 + 2*B^2*a*c*m + B^2*a*c)*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(A*B*a*c*m
 + A*B*a*c)*n + (A^2*b*c + A^2*a*d + (A^2*b*c + A^2*a*d)*m^2 + 2*(B^2*b*c +
```

```
 B^2*a*d)*n^2 + 2*(A^2*b*c + A^2*a*d)*m - 2*(A*B*b*c + A*B*a*d + (A*B*b*c +
 A*B*a*d)*m)*n)*x + 2*(A*B*a*c*m^2 + 2*A*B*a*c*m + A*B*a*c + (A*B*b*d*m^2 +
 2*A*B*b*d*m + A*B*b*d - (B^2*b*d*m + B^2*b*d)*n)*x^2 - (B^2*a*c*m + B^2*a*
c)*n + (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d)
*m - (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m)*n)*x + ((B^2*b*d*m^2 + 2*B
^2*b*d*m + B^2*b*d)*n*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 +
2*(B^2*b*c + B^2*a*d)*m)*n*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n)*log
((b*x + a)/(d*x + c)))*log(e) - 2*((B^2*a*c*m + B^2*a*c)*n^2 + ((B^2*b*d*m
+ B^2*b*d)*n^2 - (A*B*b*d*m^2 + 2*A*B*b*d*m + A*B*b*d)*n)*x^2 - (A*B*a*c*m^
2 + 2*A*B*a*c*m + A*B*a*c)*n + ((B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m)
*n^2 - (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d)
*m)*n)*x)*log((b*x + a)/(d*x + c)))*(b*g*x + a*g)^m*e^(-(m + 2)*log(b*g*x +
 a*g) + (m + 2)*log((b*x + a)/(d*x + c)) - (m + 2)*log(i/g))/((b*c - a*d)*m
^3 + 3*(b*c - a*d)*m^2 + b*c - a*d + 3*(b*c - a*d)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B \log \left(e \left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2 (bgx+ag)^m (dix+ci)^{-m-2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^m*(d*i*x +
 c*i)^(-m - 2), x)
```

3.214 $\int (ag+bgx)^m (ci+dix)^{-2-m} \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=128

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)(c+dx)(bc-ad)}-\frac{Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{i^2(m+1)^2(c+dx)(bc-ad)}$$

```
[Out] -((B*n*(a + b*x)*(g*(a + b*x))^m)/((b*c - a*d)*i^2*(1 + m)^2*(c + d*x)*(i*(
c + d*x))^m)) + ((a + b*x)*(g*(a + b*x))^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/((b*c - a*d)*i^2*(1 + m)*(c + d*x)*(i*(c + d*x))^m)
```

Rubi [A] time = 0.615875, antiderivative size = 168, normalized size of antiderivative = 1.31, number of steps used = 6, number of rules used = 4, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.085, Rules used = {6742, 37, 2554, 12}

$$\frac{A(ag+bgx)^{m+1}(ci+dix)^{-m-1}}{gi(m+1)(bc-ad)}+\frac{B(ag+bgx)^{m+1}(ci+dix)^{-m-1}\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi(m+1)(bc-ad)}-\frac{Bn(ag+bgx)^{m+1}(ci+dix)^{-m-1}}{gi(m+1)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]),x]
```

```
[Out] (A*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m))/((b*c - a*d)*g*i*(1 + m))
- (B*n*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m))/((b*c - a*d)*g*i*(1 +
m)^2) + (B*(a*g + b*g*x)^(1 + m)*(c*i + d*i*x)^(-1 - m)*Log[e*((a + b*x)/(c
 + d*x))^n])/((b*c - a*d)*g*i*(1 + m))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 37

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

Rule 2554

```
Int[Log[u_]*(v_), x_Symbol] :> With[{w = IntHide[v, x]}, Dist[Log[u], w, x]
 - Int[SimplifyIntegrand[(w*D[u, x])/u, x], x] /; InverseFunctionFreeQ[w, x
]] /; InverseFunctionFreeQ[u, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int (214c+214dx)^{-2-m}(ag+bgx)^m\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int \left(A(214c+214dx)^{-2-m}(ag+bgx)^m + B(214c+214\right.$$

$$= A\int (214c+214dx)^{-2-m}(ag+bgx)^m\,dx + B\int (214c$$

$$= \frac{A(214c+214dx)^{-1-m}(ag+bgx)^{1+m}}{214(bc-ad)g(1+m)} + \frac{B(214c+214c}{}$$

$$= \frac{A(214c+214dx)^{-1-m}(ag+bgx)^{1+m}}{214(bc-ad)g(1+m)} + \frac{B(214c+214c}{}$$

$$= -\frac{214^{-2-m}Bn(c+dx)^{-1-m}(ag+bgx)^{1+m}}{(bc-ad)g(1+m)^2} + \frac{A(214c+}{214}$$

Mathematica [A] time = 0.522248, size = 78, normalized size = 0.61

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m-1}\left(B(m+1)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Am+A-Bn\right)}{i(m+1)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]),x]
```

```
[Out] ((a + b*x)*(g*(a + b*x))^m*(i*(c + d*x))^(-1 - m)*(A + A*m - B*n + B*(1 + m
)*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i*(1 + m)^2)
```

Maple [F] time = 4.637, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^m (dix+ci)^{-2-m}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)\left(bgx+ag\right)^m (dix+ci)^{-m-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^m*(d*i*x + c
*i)^(-m - 2), x)
```

Fricas [B] time = 0.573072, size = 647, normalized size = 5.05

$$\frac{\left(Aacm - Bacn + Aac + (Abdm - Bbdn + Abd)x^2 + (Abc + Aad + (Abc + Aad)m - (Bbc + Bad)n)x + \left(Bacm + Bac + \right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] (A*a*c*m - B*a*c*n + A*a*c + (A*b*d*m - B*b*d*n + A*b*d)*x^2 + (A*b*c + A*a
*d + (A*b*c + A*a*d)*m - (B*b*c + B*a*d)*n)*x + (B*a*c*m + B*a*c + (B*b*d*m
 + B*b*d)*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*x)*log(e) + ((B*b*d*m +
 B*b*d)*n*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*n*x + (B*a*c*m + B*a*c)
*n)*log((b*x + a)/(d*x + c)))*(b*g*x + a*g)^m*e^(-(m + 2)*log(b*g*x + a*g)
+ (m + 2)*log((b*x + a)/(d*x + c)) - (m + 2)*log(i/g))/((b*c - a*d)*m^2 + b
*c - a*d + 2*(b*c - a*d)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)(bgx + ag)^m (dix + ci)^{-m-2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^m*(d*i*x + c
*i)^(-m - 2), x)
```

3.215 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=125

$$\frac{(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\text{Ei}\left(\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bi^2n(c+dx)(bc-ad)}$$

```
[Out] ((a + b*x)*(g*(a + b*x))^m*ExpIntegralEi[((1 + m)*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(B*n)])/(B*(b*c - a*d)*E^((A*(1 + m))/(B*n))*i^2*n*(e*((a +
b*x)/(c + d*x))^n)^((1 + m)/n)*(c + d*x)*(i*(c + d*x))^m)
```

Rubi [F] time = 0.736634, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/(c + d
*x))^n]),x]
```

```
[Out] Defer[Int][((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)
/(c + d*x))^n]), x]
```

Rubi steps

$$\int \frac{(215c+215dx)^{-2-m}(ag+bgx)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx = \int \frac{(215c+215dx)^{-2-m}(ag+bgx)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Mathematica [F] time = 0.231827, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]),x]
```

```
[Out] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]), x]
```

Maple [F] time = 2.954, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{m} \left(dix+ci\right)^{-2-m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{m} \left(dix+ci\right)^{-m-2}}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A), x)
```

Fricas [A] time = 0.496147, size = 227, normalized size = 1.82

$$\frac{\mathrm{Ei}\left(\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+Am+(Bm+B)\log(e)+A}{Bn}\right)e^{\left(-\frac{(Bm+2\,B)n\log\left(\frac{i}{g}\right)+Am+(Bm+B)\log(e)+A}{Bn}\right)}}{(Bbc-Bad)g^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] Ei(((B*m + B)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*n
))*e^(-((B*m + 2*B)*n*log(i/g) + A*m + (B*m + B)*log(e) + A)/(B*n))/((B*b*c
 - B*a*d)*g^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^m (dix + ci)^{-m-2}}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A), x)
```

3.216 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=206

$$\frac{(m+1)(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\operatorname{Ei}\left(\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2i^2n^2(c+dx)(bc-ad)}-\frac{(a+bx)(g(a+b}{Bi^2n(c+dx)(bc-ad)}$$

```
[Out] ((1 + m)*(a + b*x)*(g*(a + b*x))^m*ExpIntegralEi[((1 + m)*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(B*n)])/(B^2*(b*c - a*d)*E^((A*(1 + m))/(B*n))*i^2*n
^2*(e*((a + b*x)/(c + d*x))^n)^((1 + m)/n)*(c + d*x)*(i*(c + d*x))^m) - ((a
 + b*x)*(g*(a + b*x))^m)/(B*(b*c - a*d)*i^2*n*(c + d*x)*(i*(c + d*x))^m*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))
```

Rubi [F] time = 0.826472, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^2,x]
```

```
[Out] Defer[Int][((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2, x]
```

Rubi steps

$$\int \frac{(216c+216dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{(216c+216dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [F] time = 0.257235, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2,x]
```

```
[Out] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2, x]
```

Maple [F] time = 26.166, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{m} \left(dix+ci\right)^{-2-m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-g^{m}(m+1)\int -\frac{}{\left(B^{2}d^{2}i^{m+2}nx^{2}+2\,B^{2}cdi^{m+2}nx+B^{2}c^{2}i^{m+2}n\right)(dx+c)^{m}\log\left((bx+a)^{n}\right)-\left(B^{2}d^{2}i^{m+2}nx^{2}+2\,B^{2}cdi^{m+2}nx+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] -g^m*(m + 1)*integrate(-(b*x + a)^m/((B^2*d^2*i^(m + 2)*n*x^2 + 2*B^2*c*d*i
^(m + 2)*n*x + B^2*c^2*i^(m + 2)*n)*(d*x + c)^m*log((b*x + a)^n) - (B^2*d^2
*i^(m + 2)*n*x^2 + 2*B^2*c*d*i^(m + 2)*n*x + B^2*c^2*i^(m + 2)*n)*(d*x + c)
^m*log((d*x + c)^n) + (B^2*c^2*i^(m + 2)*n*log(e) + A*B*c^2*i^(m + 2)*n + (
B^2*d^2*i^(m + 2)*n*log(e) + A*B*d^2*i^(m + 2)*n)*x^2 + 2*(B^2*c*d*i^(m + 2
)*n*log(e) + A*B*c*d*i^(m + 2)*n)*x)*(d*x + c)^m), x) - (b*g^m*x + a*g^m)*(
b*x + a)^m/(((b*c*d*i^(m + 2)*n - a*d^2*i^(m + 2)*n)*B^2*x + (b*c^2*i^(m +
2)*n - a*c*d*i^(m + 2)*n)*B^2)*(d*x + c)^m*log((b*x + a)^n) - ((b*c*d*i^(m
+ 2)*n - a*d^2*i^(m + 2)*n)*B^2*x + (b*c^2*i^(m + 2)*n - a*c*d*i^(m + 2)*n)
*B^2)*(d*x + c)^m*log((d*x + c)^n) + ((b*c^2*i^(m + 2)*n - a*c*d*i^(m + 2)*
n)*A*B + (b*c^2*i^(m + 2)*n*log(e) - a*c*d*i^(m + 2)*n*log(e))*B^2 + ((b*c*
d*i^(m + 2)*n - a*d^2*i^(m + 2)*n)*A*B + (b*c*d*i^(m + 2)*n*log(e) - a*d^2*
i^(m + 2)*n*log(e))*B^2)*x)*(d*x + c)^m)
```

Fricas [A] time = 0.544517, size = 676, normalized size = 3.28

$$-\frac{\left(Bbdg^{2}nx^{2}+Bacg^{2}n+(Bbc+Bad)g^{2}nx\right)\left(bgx+ag\right)^{m}e^{\left(-(m+2)\log\left(bgx+ag\right)+(m+2)\log\left(\frac{bx+a}{dx+c}\right)-(m+2)\log\left(\frac{i}{g}\right)\right)}-\left((Bm+B)n\log\left(\frac{b}{d}\right.\right.}{\left(B^{3}bc-B^{3}ad\right)g^{2}n^{3}\log\left(\frac{bx+a}{dx+c}\right)+\left(B^{3}bc-B^{3}ad\right)g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] -((B*b*d*g^2*n*x^2 + B*a*c*g^2*n + (B*b*c + B*a*d)*g^2*n*x)*(b*g*x + a*g)^m
*e^(-(m + 2)*log(b*g*x + a*g) + (m + 2)*log((b*x + a)/(d*x + c)) - (m + 2)*
log(i/g)) - ((B*m + B)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e)
+ A)*Ei(((B*m + B)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)
/(B*n))*e^(-((B*m + 2*B)*n*log(i/g) + A*m + (B*m + B)*log(e) + A)/(B*n)))/(
(B^3*b*c - B^3*a*d)*g^2*n^3*log((b*x + a)/(d*x + c)) + (B^3*b*c - B^3*a*d)*
g^2*n^2*log(e) + (A*B^2*b*c - A*B^2*a*d)*g^2*n^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^m (dix + ci)^{-m-2}}{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^2, x)
```

3.217 $\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$

Optimal. Leaf size=295

$$\frac{(m+1)^2(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}\mathrm{Ei}\left(\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3i^2n^3(c+dx)(bc-ad)}-\frac{(m+1)(a+bx)(g(a}{2B^2i^2n^2(c+dx)(bc-ad}$$

```
[Out] ((1 + m)^2*(a + b*x)*(g*(a + b*x))^m*ExpIntegralEi[((1 + m)*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/(B*n)])/(2*B^3*(b*c - a*d)*E^((A*(1 + m))/(B*n))*i
^2*n^3*(e*((a + b*x)/(c + d*x))^n)^((1 + m)/n)*(c + d*x)*(i*(c + d*x))^m) -
 ((a + b*x)*(g*(a + b*x))^m)/(2*B*(b*c - a*d)*i^2*n*(c + d*x)*(i*(c + d*x))
^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) - ((1 + m)*(a + b*x)*(g*(a + b
*x))^m)/(2*B^2*(b*c - a*d)*i^2*n^2*(c + d*x)*(i*(c + d*x))^m*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))
```

Rubi [F] time = 0.814608, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^3,x]
```

```
[Out] Defer[Int][((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^3, x]
```

Rubi steps

$$\int \frac{(217c+217dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx=\int \frac{(217c+217dx)^{-2-m}(ag+bgx)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Mathematica [F] time = 0.324248, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^m(ci+dix)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3,x]
```

```
[Out] Integrate[((a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m))/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3, x]
```

Maple [F] time = 23.922, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{m} (dix + ci)^{-2-m} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] -(m^2 + 2*m + 1)*g^m*integrate(-1/2*(b*x + a)^m/((B^3*d^2*i^(m + 2)*n^2*x^2
 + 2*B^3*c*d*i^(m + 2)*n^2*x + B^3*c^2*i^(m + 2)*n^2)*(d*x + c)^m*log((b*x
+ a)^n) - (B^3*d^2*i^(m + 2)*n^2*x^2 + 2*B^3*c*d*i^(m + 2)*n^2*x + B^3*c^2*
i^(m + 2)*n^2)*(d*x + c)^m*log((d*x + c)^n) + (B^3*c^2*i^(m + 2)*n^2*log(e)
 + A*B^2*c^2*i^(m + 2)*n^2 + (B^3*d^2*i^(m + 2)*n^2*log(e) + A*B^2*d^2*i^(m
 + 2)*n^2)*x^2 + 2*(B^3*c*d*i^(m + 2)*n^2*log(e) + A*B^2*c*d*i^(m + 2)*n^2)
*x)*(d*x + c)^m), x) - 1/2*((B*b*g^m*(m + 1)*x + B*a*g^m*(m + 1))*(b*x + a)
^m*log((b*x + a)^n) - (B*b*g^m*(m + 1)*x + B*a*g^m*(m + 1))*(b*x + a)^m*log
((d*x + c)^n) + (A*a*g^m*(m + 1) + (g^m*(m + 1)*log(e) + g^m*n)*B*a + (A*b*
g^m*(m + 1) + (g^m*(m + 1)*log(e) + g^m*n)*B*b)*x)*(b*x + a)^m)/(((b*c*d*i^
(m + 2)*n^2 - a*d^2*i^(m + 2)*n^2)*B^4*x + (b*c^2*i^(m + 2)*n^2 - a*c*d*i^(
m + 2)*n^2)*B^4)*(d*x + c)^m*log((b*x + a)^n)^2 + ((b*c*d*i^(m + 2)*n^2 - a
*d^2*i^(m + 2)*n^2)*B^4*x + (b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*B^4
)*(d*x + c)^m*log((d*x + c)^n)^2 + 2*((b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2
)*n^2)*A*B^3 + (b*c^2*i^(m + 2)*n^2*log(e) - a*c*d*i^(m + 2)*n^2*log(e))*B^
4 + ((b*c*d*i^(m + 2)*n^2 - a*d^2*i^(m + 2)*n^2)*A*B^3 + (b*c*d*i^(m + 2)*n
^2*log(e) - a*d^2*i^(m + 2)*n^2*log(e))*B^4)*x)*(d*x + c)^m*log((b*x + a)^n
) + ((b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*A^2*B^2 + 2*(b*c^2*i^(m +
2)*n^2*log(e) - a*c*d*i^(m + 2)*n^2*log(e))*A*B^3 + (b*c^2*i^(m + 2)*n^2*lo
g(e)^2 - a*c*d*i^(m + 2)*n^2*log(e)^2)*B^4 + ((b*c*d*i^(m + 2)*n^2 - a*d^2*
i^(m + 2)*n^2)*A^2*B^2 + 2*(b*c*d*i^(m + 2)*n^2*log(e) - a*d^2*i^(m + 2)*n^
2*log(e))*A*B^3 + (b*c*d*i^(m + 2)*n^2*log(e)^2 - a*d^2*i^(m + 2)*n^2*log(e
)^2)*B^4)*x)*(d*x + c)^m - 2*(((b*c*d*i^(m + 2)*n^2 - a*d^2*i^(m + 2)*n^2)*
B^4*x + (b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*B^4)*(d*x + c)^m*log((b
*x + a)^n) + ((b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*A*B^3 + (b*c^2*i^
(m + 2)*n^2*log(e) - a*c*d*i^(m + 2)*n^2*log(e))*B^4 + ((b*c*d*i^(m + 2)*n^
2 - a*d^2*i^(m + 2)*n^2)*A*B^3 + (b*c*d*i^(m + 2)*n^2*log(e) - a*d^2*i^(m +
 2)*n^2*log(e))*B^4)*x)*(d*x + c)^m)*log((d*x + c)^n))
```

Fricas [B] time = 0.582135, size = 1791, normalized size = 6.07

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -1/2*((B^2*a*c*g^2*n^2 + (B^2*b*d*g^2*n^2 + (A*B*b*d*g^2*m + A*B*b*d*g^2)*n
)*x^2 + (A*B*a*c*g^2*m + A*B*a*c*g^2)*n + ((B^2*b*c + B^2*a*d)*g^2*n^2 + ((
A*B*b*c + A*B*a*d)*g^2*m + (A*B*b*c + A*B*a*d)*g^2)*n)*x + ((B^2*b*d*g^2*m
+ B^2*b*d*g^2)*n*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2
)*n*x + (B^2*a*c*g^2*m + B^2*a*c*g^2)*n)*log(e) + ((B^2*b*d*g^2*m + B^2*b*d
*g^2)*n^2*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2)*n^2*x
 + (B^2*a*c*g^2*m + B^2*a*c*g^2)*n^2)*log((b*x + a)/(d*x + c)))*(b*g*x + a*
g)^m*e^(-(m + 2)*log(b*g*x + a*g) + (m + 2)*log((b*x + a)/(d*x + c)) - (m +
 2)*log(i/g)) - ((B^2*m^2 + 2*B^2*m + B^2)*n^2*log((b*x + a)/(d*x + c))^2 +
 A^2*m^2 + 2*A^2*m + (B^2*m^2 + 2*B^2*m + B^2)*log(e)^2 + 2*(A*B*m^2 + 2*A*
B*m + A*B)*n*log((b*x + a)/(d*x + c)) + A^2 + 2*(A*B*m^2 + 2*A*B*m + (B^2*m
^2 + 2*B^2*m + B^2)*n*log((b*x + a)/(d*x + c)) + A*B)*log(e))*Ei(((B*m + B)
*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*n))*e^(-((B*m
+ 2*B)*n*log(i/g) + A*m + (B*m + B)*log(e) + A)/(B*n)))/((B^5*b*c - B^5*a*d
)*g^2*n^5*log((b*x + a)/(d*x + c))^2 + (B^5*b*c - B^5*a*d)*g^2*n^3*log(e)^2
 + 2*(A*B^4*b*c - A*B^4*a*d)*g^2*n^4*log((b*x + a)/(d*x + c)) + (A^2*B^3*b*
c - A^2*B^3*a*d)*g^2*n^3 + 2*((B^5*b*c - B^5*a*d)*g^2*n^4*log((b*x + a)/(d*
x + c)) + (A*B^4*b*c - A*B^4*a*d)*g^2*n^3)*log(e))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{m}(dix+ci)^{-m-2}}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^3, x)
```

3.218 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3 dx$

Optimal. Leaf size=309

$$-\frac{6B^2n^2(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)^3(c+dx)(bc-ad)}-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\right.}{i^2(m+1)(c+dx)(bc-ad)}$$

```
[Out] (-6*B^3*n^3*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/((b*c -
 a*d)*i^2*(1 + m)^4*(c + d*x)) - (6*B^2*n^2*(a + b*x)*(g*(a + b*x))^(-2 - m
)*(i*(c + d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d
)*i^2*(1 + m)^3*(c + d*x)) - (3*B*n*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c
+ d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)*i^2*
(1 + m)^2*(c + d*x)) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 +
 m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/((b*c - a*d)*i^2*(1 + m)*(c +
 d*x))
```

Rubi [F] time = 2.05475, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3 dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^3,x]
```

```
[Out] -((A^3*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d)*g*i*(1 +
m))) - (3*A^2*B*n*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d
)*g*i*(1 + m)^2) - (3*A^2*B*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m)*Lo
g[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i*(1 + m)) + 3*A*B^2*Defer[Int
][(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*Log[e*((a + b*x)/(c + d*x))^n]^2,
x] + B^3*Defer[Int][(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*Log[e*((a + b*x)
/(c + d*x))^n]^3, x]
```

Rubi steps

$$\int (218c+218dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3 dx=\int \left(A^3(218c+218dx)^m(ag+bgx)^{-2-m}+3A^2B(2\right.$$

$$=A^3\int (218c+218dx)^m(ag+bgx)^{-2-m}\,dx+\left(3A^2I\right.$$

$$=-\frac{A^3(218c+218dx)^{1+m}(ag+bgx)^{-1-m}}{218(bc-ad)g(1+m)}-\frac{3A^2B(2}{}$$

$$=-\frac{A^3(218c+218dx)^{1+m}(ag+bgx)^{-1-m}}{218(bc-ad)g(1+m)}-\frac{3A^2B(2}{}$$

$$=-\frac{3\ 218^mA^2Bn(c+dx)^{1+m}(ag+bgx)^{-1-m}}{(bc-ad)g(1+m)^2}-\frac{A^3(2}{}$$

Mathematica [A] time = 6.69392, size = 206, normalized size = 0.67

$$-\frac{(c+dx)(g(a+bx))^{-m-1}(i(c+dx))^m\left(3B(m+1)\left(A^2(m+1)^2+2AB(m+1)n+2B^2n^2\right)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3B^2(m+1)^2(A}{g(m+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^3,x]
```

```
[Out] -(((g*(a + b*x))^(-1 - m)*(c + d*x)*(i*(c + d*x))^m*(A^3*(1 + m)^3 + 3*A^2*
B*(1 + m)^2*n + 6*A*B^2*(1 + m)*n^2 + 6*B^3*n^3 + 3*B*(1 + m)*(A^2*(1 + m)^
2 + 2*A*B*(1 + m)*n + 2*B^2*n^2)*Log[e*((a + b*x)/(c + d*x))^n] + 3*B^2*(1
+ m)^2*(A + A*m + B*n)*Log[e*((a + b*x)/(c + d*x))^n]^2 + B^3*(1 + m)^3*Log
[e*((a + b*x)/(c + d*x))^n]^3))/((b*c - a*d)*g*(1 + m)^4))
```

Maple [F] time = 5.698, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m}\left(dix+ci\right)^m\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^3\left(bgx+ag\right)^{-m-2}\left(dix+ci\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^3*(b*g*x + a*g)^(-m - 2)*(
d*i*x + c*i)^m, x)
```

Fricas [B] time = 0.822236, size = 5785, normalized size = 18.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -(A^3*a*c*m^3 + 6*B^3*a*c*n^3 + 3*A^3*a*c*m^2 + 3*A^3*a*c*m + A^3*a*c + (B^
3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c + (B^3*b*d*m^3 + 3*B^3*b*
d*m^2 + 3*B^3*b*d*m + B^3*b*d)*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*
d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*x)*log(e)^3 +
 ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^3*x^2 + (B^3*b*c
+ B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*
c + B^3*a*d)*m)*n^3*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*
c)*n^3)*log((b*x + a)/(d*x + c))^3 + 6*(A*B^2*a*c*m + A*B^2*a*c)*n^2 + (A^3
*b*d*m^3 + 6*B^3*b*d*n^3 + 3*A^3*b*d*m^2 + 3*A^3*b*d*m + A^3*b*d + 6*(A*B^2
*b*d*m + A*B^2*b*d)*n^2 + 3*(A^2*B*b*d*m^2 + 2*A^2*B*b*d*m + A^2*B*b*d)*n)*
x^2 + 3*(A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c + (A*B
^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d + (B^3*b*d*m^2 + 2
*B^3*b*d*m + B^3*b*d)*n)*x^2 + (B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n + (A
*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a
*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3
*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n)*x + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 +
 3*B^3*b*d*m + B^3*b*d)*n*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^
3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*n*x + (B^3*a*c*m^3
 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n)*log((b*x + a)/(d*x + c)))*log(
e)^2 + 3*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^3 + (A*B^2*a*c*m^3 + 3*A*
B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m
+ B^3*b*d)*n^3 + (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b
*d)*n^2)*x^2 + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c +
 B^3*a*d)*m)*n^3 + (A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3
*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m)*n^2)*x)*log((b*
x + a)/(d*x + c))^2 + 3*(A^2*B*a*c*m^2 + 2*A^2*B*a*c*m + A^2*B*a*c)*n + (A^
3*b*c + A^3*a*d + (A^3*b*c + A^3*a*d)*m^3 + 6*(B^3*b*c + B^3*a*d)*n^3 + 3*(
A^3*b*c + A^3*a*d)*m^2 + 6*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)
*m)*n^2 + 3*(A^3*b*c + A^3*a*d)*m + 3*(A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c +
 A^2*B*a*d)*m^2 + 2*(A^2*B*b*c + A^2*B*a*d)*m)*n)*x + 3*(A^2*B*a*c*m^3 + 3*
A^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c + 2*(B^3*a*c*m + B^3*a*c)*n^2 + (
A^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d + 2*(B^3*b*d*m
+ B^3*b*d)*n^2 + 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 + ((B
^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^2*x^2 + (B^3*b*c + B^
3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c +
B^3*a*d)*m)*n^2*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n
^2)*log((b*x + a)/(d*x + c))^2 + 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a
*c)*n + (A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c
 + A^2*B*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^2 + 3*(
A^2*B*b*c + A^2*B*a*d)*m + 2*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*
d)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n)*x + 2*((B^3*a*c*m^2 + 2*B^3*a*c*m
+ B^3*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^2 + (A*B^2*b*d*m^
3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 + (A*B^2*a*c*m^3 +
3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n + ((B^3*b*c + B^3*a*d + (B^3
*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n^2 + (A*B^2*b*c + A*B^2*a*d
 + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b
*c + A*B^2*a*d)*m)*n)*x)*log((b*x + a)/(d*x + c)))*log(e) + 3*(2*(B^3*a*c*m
 + B^3*a*c)*n^3 + 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a*c)*n^2 + (2*(B
^3*b*d*m + B^3*b*d)*n^3 + 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n^2
 + (A^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d)*n)*x^2 + (
A^2*B*a*c*m^3 + 3*A^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c)*n + (2*(B^3*b*
c + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^3 + 2*(A*B^2*b*c + A*B^2*a*d + (A*B^
2*b*c + A*B^2*a*d)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n^2 + (A^2*B*b*c + A^
2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c + A^2*B*a*d)*m^2 + 3*(
A^2*B*b*c + A^2*B*a*d)*m)*n)*x)*log((b*x + a)/(d*x + c)))*(b*g*x + a*g)^(-m
 - 2)*e^(m*log(b*g*x + a*g) - m*log((b*x + a)/(d*x + c)) + m*log(i/g))/((b*
c - a*d)*m^4 + 4*(b*c - a*d)*m^3 + 6*(b*c - a*d)*m^2 + b*c - a*d + 4*(b*c -
 a*d)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{3}\left(bgx+ag\right)^{-m-2}(dix+ci)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^3*(b*g*x + a*g)^(-m - 2)*(
d*i*x + c*i)^m, x)
```

3.219 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=223

$$-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{i^2(m+1)(c+dx)(bc-ad)}-\frac{2Bn(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(\right.\right.}{i^2(m+1)^2(c+dx)(bc-ad)}$$

```
[Out] (-2*B^2*n^2*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/((b*c -
 a*d)*i^2*(1 + m)^3*(c + d*x)) - (2*B*n*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i
*(c + d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i^
2*(1 + m)^2*(c + d*x)) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2
 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)*i^2*(1 + m)*(c
 + d*x))
```

Rubi [F] time = 1.15911, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2,x]
```

```
[Out] -((A^2*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d)*g*i*(1 +
m))) - (2*A*B*n*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d)*
g*i*(1 + m)^2) - (2*A*B*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m)*Log[e*
((a + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i*(1 + m)) + B^2*Defer[Int][(a*g +
 b*g*x)^(-2 - m)*(c*i + d*i*x)^m*Log[e*((a + b*x)/(c + d*x))^n]^2, x]
```

Rubi steps

$$\int (219c+219dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \int \left(A^2(219c+219dx)^m(ag+bgx)^{-2-m}+2AB(21\right.$$

$$= A^2\int (219c+219dx)^m(ag+bgx)^{-2-m}\,dx+(2AB$$

$$= -\frac{A^2(219c+219dx)^{1+m}(ag+bgx)^{-1-m}}{219(bc-ad)g(1+m)}-\frac{2AB(21}{}$$

$$= -\frac{A^2(219c+219dx)^{1+m}(ag+bgx)^{-1-m}}{219(bc-ad)g(1+m)}-\frac{2AB(21}{}$$

$$= -\frac{2\ 219^m ABn(c+dx)^{1+m}(ag+bgx)^{-1-m}}{(bc-ad)g(1+m)^2}-\frac{A^2(21}{}$$

Mathematica [A] time = 2.03633, size = 134, normalized size = 0.6

$$-\frac{(c+dx)(g(a+bx))^{-m-1}(i(c+dx))^m\left(2B(m+1)(Am+A+Bn)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+B^2(m+1)^2\log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A^2(m+\right.}{g(m+1)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2,x]
```

```
[Out] -(((g*(a + b*x))^(-1 - m)*(c + d*x)*(i*(c + d*x))^m*(A^2*(1 + m)^2 + 2*A*B*
(1 + m)*n + 2*B^2*n^2 + 2*B*(1 + m)*(A + A*m + B*n)*Log[e*((a + b*x)/(c + d
*x))^n] + B^2*(1 + m)^2*Log[e*((a + b*x)/(c + d*x))^n]^2))/((b*c - a*d)*g*(
1 + m)^3))
```

Maple [F] time = 4.479, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m}\left(dix+ci\right)^m\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2\left(bgx+ag\right)^{-m-2}(dix+ci)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^(-m - 2)*(
d*i*x + c*i)^m, x)
```

Fricas [B] time = 0.646078, size = 2186, normalized size = 9.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] -(A^2*a*c*m^2 + 2*B^2*a*c*n^2 + 2*A^2*a*c*m + A^2*a*c + (A^2*b*d*m^2 + 2*B^
2*b*d*n^2 + 2*A^2*b*d*m + A^2*b*d + 2*(A*B*b*d*m + A*B*b*d)*n)*x^2 + (B^2*a
```

```
*c*m^2 + 2*B^2*a*c*m + B^2*a*c + (B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*x^2
+ (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*x
)*log(e)^2 + ((B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*n^2*x^2 + (B^2*b*c + B^
2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*n^2*x + (B^2*a*c
*m^2 + 2*B^2*a*c*m + B^2*a*c)*n^2)*log((b*x + a)/(d*x + c))^2 + 2*(A*B*a*c*
m + A*B*a*c)*n + (A^2*b*c + A^2*a*d + (A^2*b*c + A^2*a*d)*m^2 + 2*(B^2*b*c
+ B^2*a*d)*n^2 + 2*(A^2*b*c + A^2*a*d)*m + 2*(A*B*b*c + A*B*a*d + (A*B*b*c
+ A*B*a*d)*m)*n)*x + 2*(A*B*a*c*m^2 + 2*A*B*a*c*m + A*B*a*c + (A*B*b*d*m^2
+ 2*A*B*b*d*m + A*B*b*d + (B^2*b*d*m + B^2*b*d)*n)*x^2 + (B^2*a*c*m + B^2*a
*c)*n + (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d
)*m + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m)*n)*x + ((B^2*b*d*m^2 + 2*
B^2*b*d*m + B^2*b*d)*n*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 +
 2*(B^2*b*c + B^2*a*d)*m)*n*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n)*lo
g((b*x + a)/(d*x + c)))*log(e) + 2*((B^2*a*c*m + B^2*a*c)*n^2 + ((B^2*b*d*m
 + B^2*b*d)*n^2 + (A*B*b*d*m^2 + 2*A*B*b*d*m + A*B*b*d)*n)*x^2 + (A*B*a*c*m
^2 + 2*A*B*a*c*m + A*B*a*c)*n + ((B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m
)*n^2 + (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d
)*m)*n)*x)*log((b*x + a)/(d*x + c)))*(b*g*x + a*g)^(-m - 2)*e^(m*log(b*g*x
+ a*g) - m*log((b*x + a)/(d*x + c)) + m*log(i/g))/((b*c - a*d)*m^3 + 3*(b*c
 - a*d)*m^2 + b*c - a*d + 3*(b*c - a*d)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}\left(bgx+ag\right)^{-m-2}(dix+ci)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^(-m - 2)*(
d*i*x + c*i)^m, x)
```

3.220 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=137

$$-\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{i^2(m+1)(c+dx)(bc-ad)}-\frac{Bn(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{i^2(m+1)^2(c+dx)(bc-ad)}$$

```
[Out] -((B*n*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/((b*c - a*d)
*i^2*(1 + m)^2*(c + d*x))) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x)
)^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i^2*(1 + m)*
(c + d*x))
```

Rubi [A] time = 0.616366, antiderivative size = 170, normalized size of antiderivative = 1.24, number of steps used = 6, number of rules used = 4, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.085, Rules used = {6742, 37, 2554, 12}

$$-\frac{A(ag+bgx)^{-m-1}(ci+dix)^{m+1}}{gi(m+1)(bc-ad)}-\frac{B(ag+bgx)^{-m-1}(ci+dix)^{m+1}\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi(m+1)(bc-ad)}-\frac{Bn(ag+bgx)^{-m-1}(ci+dix)^{m+1}}{gi(m+1)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]),x]
```

```
[Out] -((A*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d)*g*i*(1 + m)
)) - (B*n*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d)*g*i*(1
 + m)^2) - (B*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m)*Log[e*((a + b*x)
/(c + d*x))^n])/((b*c - a*d)*g*i*(1 + m))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 37

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

Rule 2554

```
Int[Log[u_]*(v_), x_Symbol] :> With[{w = IntHide[v, x]}, Dist[Log[u], w, x]
 - Int[SimplifyIntegrand[(w*D[u, x])/u, x], x] /; InverseFunctionFreeQ[w, x
]] /; InverseFunctionFreeQ[u, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int (220c+220dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \int \left(A(220c+220dx)^m(ag+bgx)^{-2-m}+B(220c+\right.$$

$$= A\int (220c+220dx)^m(ag+bgx)^{-2-m}\,dx + B\int (22$$

$$= -\frac{A(220c+220dx)^{1+m}(ag+bgx)^{-1-m}}{220(bc-ad)g(1+m)} - \frac{B(220c+}{}$$

$$= -\frac{A(220c+220dx)^{1+m}(ag+bgx)^{-1-m}}{220(bc-ad)g(1+m)} - \frac{B(220c+}{}$$

$$= -\frac{220^m Bn(c+dx)^{1+m}(ag+bgx)^{-1-m}}{(bc-ad)g(1+m)^2} - \frac{A(220c+}{22}$$

Mathematica [A] time = 0.508259, size = 78, normalized size = 0.57

$$-\frac{(c+dx)(g(a+bx))^{-m-1}(i(c+dx))^m\left(B(m+1)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Am+A+Bn\right)}{g(m+1)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]),x]
```

```
[Out] -(((g*(a + b*x))^(-1 - m)*(c + d*x)*(i*(c + d*x))^m*(A + A*m + B*n + B*(1 +
 m)*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*g*(1 + m)^2))
```

Maple [F] time = 4.586, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m}(dix+ci)^m\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)\left(bgx+ag\right)^{-m-2}(dix+ci)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^(-m - 2)*(d*
i*x + c*i)^m, x)
```

Fricas [A] time = 0.538503, size = 632, normalized size = 4.61

$$-\frac{\left(Aacm + Bacn + Aac + (Abdm + Bbdn + Abd)x^2 + (Abc + Aad + (Abc + Aad)m + (Bbc + Bad)n)x + \left(Bacm + Bac + \right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] -(A*a*c*m + B*a*c*n + A*a*c + (A*b*d*m + B*b*d*n + A*b*d)*x^2 + (A*b*c + A*
a*d + (A*b*c + A*a*d)*m + (B*b*c + B*a*d)*n)*x + (B*a*c*m + B*a*c + (B*b*d*
m + B*b*d)*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*x)*log(e) + ((B*b*d*m
+ B*b*d)*n*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*n*x + (B*a*c*m + B*a*c
)*n)*log((b*x + a)/(d*x + c)))*(b*g*x + a*g)^(-m - 2)*e^(m*log(b*g*x + a*g)
 - m*log((b*x + a)/(d*x + c)) + m*log(i/g))/((b*c - a*d)*m^2 + b*c - a*d +
2*(b*c - a*d)*m)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)\left(bgx + ag\right)^{-m-2}(dix + ci)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^(-m - 2)*(d*
i*x + c*i)^m, x)
```

3.221 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=128

$$\frac{(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\text{Ei}\left(-\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bi^2n(c+dx)(bc-ad)}$$

```
[Out] (E^((A*(1 + m))/(B*n))*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a + b*x)/(c +
d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*ExpIntegralEi[-(((1 + m)*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(B*n))])/(B*(b*c - a*d)*i^2*n*(c + d*x))
```

Rubi [F] time = 0.694768, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/(c + d
*x))^n]),x]
```

```
[Out] Defer[Int][((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)
/(c + d*x))^n]), x]
```

Rubi steps

$$\int \frac{(221c+221dx)^m(ag+bgx)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\int \frac{(221c+221dx)^m(ag+bgx)^{-2-m}}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Mathematica [F] time = 0.234732, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]),x]
```

```
[Out] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n]), x]
```

Maple [F] time = 3.039, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m} \left(dix+ci\right)^{m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{-m-2} \left(dix+ci\right)^{m}}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A), x)
```

Fricas [A] time = 0.528145, size = 216, normalized size = 1.69

$$\frac{\operatorname{Ei}\left(-\frac{(Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)+Am+(Bm+B)\log(e)+A}{Bn}\right)e^{\left(\frac{Bmn\log\left(\frac{i}{g}\right)+Am+(Bm+B)\log(e)+A}{Bn}\right)}}{(Bbc-Bad)g^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="fricas")
```

```
[Out] Ei(-((B*m + B)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*
n))*e^((B*m*n*log(i/g) + A*m + (B*m + B)*log(e) + A)/(B*n))/((B*b*c - B*a*d
)*g^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^{-m-2}(dix+ci)^m}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A), x)
```

3.222 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=214

$$-\frac{(m+1)(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\text{Ei}\left(-\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2i^2n^2(c+dx)(bc-ad)}-\frac{(a+bx)(g(a+b}{Bi^2n(c+dx)(bc-ad}$$

```
[Out] -((E^((A*(1 + m))/(B*n))*(1 + m)*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a +
b*x)/(c + d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*ExpIntegralEi[-(((1 +
m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(B*n))])/(B^2*(b*c - a*d)*i^2*n^
2*(c + d*x))) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/(B
*(b*c - a*d)*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
```

Rubi [F] time = 0.775964, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^2,x]
```

```
[Out] Defer[Int][((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2, x]
```

Rubi steps

$$\int \frac{(222c+222dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{(222c+222dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [F] time = 0.260073, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2,x]
```

```
[Out] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^2, x]
```

Maple [F] time = 25.665, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m} (dix+ci)^m \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$i^m(m+1)\int -\frac{}{\left(B^2b^2g^{m+2}nx^2+2\,B^2abg^{m+2}nx+B^2a^2g^{m+2}n\right)(bx+a)^m\log\left((bx+a)^n\right)-\left(B^2b^2g^{m+2}nx^2+2\,B^2abg^{m+2}n\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="maxima")
```

```
[Out] i^m*(m + 1)*integrate(-(d*x + c)^m/((B^2*b^2*g^(m + 2)*n*x^2 + 2*B^2*a*b*g^
(m + 2)*n*x + B^2*a^2*g^(m + 2)*n)*(b*x + a)^m*log((b*x + a)^n) - (B^2*b^2*
g^(m + 2)*n*x^2 + 2*B^2*a*b*g^(m + 2)*n*x + B^2*a^2*g^(m + 2)*n)*(b*x + a)^
m*log((d*x + c)^n) + (B^2*a^2*g^(m + 2)*n*log(e) + A*B*a^2*g^(m + 2)*n + (B
^2*b^2*g^(m + 2)*n*log(e) + A*B*b^2*g^(m + 2)*n)*x^2 + 2*(B^2*a*b*g^(m + 2)
*n*log(e) + A*B*a*b*g^(m + 2)*n)*x)*(b*x + a)^m), x) - (d*i^m*x + c*i^m)*(d
*x + c)^m/(((b^2*c*g^(m + 2)*n - a*b*d*g^(m + 2)*n)*B^2*x + (a*b*c*g^(m + 2
)*n - a^2*d*g^(m + 2)*n)*B^2)*(b*x + a)^m*log((b*x + a)^n) - ((b^2*c*g^(m +
 2)*n - a*b*d*g^(m + 2)*n)*B^2*x + (a*b*c*g^(m + 2)*n - a^2*d*g^(m + 2)*n)*
B^2)*(b*x + a)^m*log((d*x + c)^n) + ((a*b*c*g^(m + 2)*n - a^2*d*g^(m + 2)*n
)*A*B + (a*b*c*g^(m + 2)*n*log(e) - a^2*d*g^(m + 2)*n*log(e))*B^2 + ((b^2*c
*g^(m + 2)*n - a*b*d*g^(m + 2)*n)*A*B + (b^2*c*g^(m + 2)*n*log(e) - a*b*d*g
^(m + 2)*n*log(e))*B^2)*x)*(b*x + a)^m)
```

Fricas [A] time = 0.538907, size = 649, normalized size = 3.03

$$-\frac{\left(Bbdg^2nx^2+Bacg^2n+(Bbc+Bad)g^2nx\right)\left(bgx+ag\right)^{-m-2}e^{\left(m\log\left(bgx+ag\right)-m\log\left(\frac{bx+a}{dx+c}\right)+m\log\left(\frac{i}{g}\right)\right)}+\left((Bm+B)n\log\left(\frac{bx+a}{dx+c}\right)\right.}{\left(B^3bc-B^3ad\right)g^2n^3\log\left(\frac{bx+a}{dx+c}\right)+\left(B^3bc-B^3ad\right)g^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="fricas")
```

```
[Out] -((B*b*d*g^2*n*x^2 + B*a*c*g^2*n + (B*b*c + B*a*d)*g^2*n*x)*(b*g*x + a*g)^(
-m - 2)*e^(m*log(b*g*x + a*g) - m*log((b*x + a)/(d*x + c)) + m*log(i/g)) +
((B*m + B)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)*Ei(-((B
*m + B)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*n))*e^(
(B*m*n*log(i/g) + A*m + (B*m + B)*log(e) + A)/(B*n)))/((B^3*b*c - B^3*a*d)*
g^2*n^3*log((b*x + a)/(d*x + c)) + (B^3*b*c - B^3*a*d)*g^2*n^2*log(e) + (A*
B^2*b*c - A*B^2*a*d)*g^2*n^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^{-m-2}(dix + ci)^m}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^2, x)
```

3.223 $\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$

Optimal. Leaf size=306

$$\frac{(m+1)^2(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\text{Ei}\left(-\frac{(m+1)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3i^2n^3(c+dx)(bc-ad)}+\frac{(m+1)(a+bx)}{2B^2i^2n^2(c+dx)(b}$$

```
[Out] (E^((A*(1 + m))/(B*n))*(1 + m)^2*(a + b*x)*(g*(a + b*x))^(-2 - m)*(e*((a +
b*x)/(c + d*x))^n)^((1 + m)/n)*(i*(c + d*x))^(2 + m)*ExpIntegralEi[-(((1 +
m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(B*n))])/(2*B^3*(b*c - a*d)*i^2*
n^3*(c + d*x)) - ((a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/(
2*B*(b*c - a*d)*i^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) +
 ((1 + m)*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2 + m))/(2*B^2*(b
*c - a*d)*i^2*n^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
```

Rubi [F] time = 0.757231, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^3,x]
```

```
[Out] Defer[Int][((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)
/(c + d*x))^n])^3, x]
```

Rubi steps

$$\int \frac{(223c+223dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx=\int \frac{(223c+223dx)^m(ag+bgx)^{-2-m}}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Mathematica [F] time = 0.324389, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^{-2-m}(ci+dix)^m}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3,x]
```

```
[Out] Integrate[((a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m)/(A + B*Log[e*((a + b*x)/
(c + d*x))^n])^3, x]
```

Maple [F] time = 25.781, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m} \left(dix+ci\right)^{m} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] -(m^2 + 2*m + 1)*i^m*integrate(-1/2*(d*x + c)^m/((B^3*b^2*g^(m + 2)*n^2*x^2
 + 2*B^3*a*b*g^(m + 2)*n^2*x + B^3*a^2*g^(m + 2)*n^2)*(b*x + a)^m*log((b*x
+ a)^n) - (B^3*b^2*g^(m + 2)*n^2*x^2 + 2*B^3*a*b*g^(m + 2)*n^2*x + B^3*a^2*
g^(m + 2)*n^2)*(b*x + a)^m*log((d*x + c)^n) + (B^3*a^2*g^(m + 2)*n^2*log(e)
 + A*B^2*a^2*g^(m + 2)*n^2 + (B^3*b^2*g^(m + 2)*n^2*log(e) + A*B^2*b^2*g^(m
 + 2)*n^2)*x^2 + 2*(B^3*a*b*g^(m + 2)*n^2*log(e) + A*B^2*a*b*g^(m + 2)*n^2)
*x)*(b*x + a)^m), x) + 1/2*((B*d*i^m*(m + 1)*x + B*c*i^m*(m + 1))*(d*x + c)
^m*log((b*x + a)^n) - (B*d*i^m*(m + 1)*x + B*c*i^m*(m + 1))*(d*x + c)^m*log
((d*x + c)^n) + (A*c*i^m*(m + 1) + (i^m*(m + 1)*log(e) - i^m*n)*B*c + (A*d*
i^m*(m + 1) + (i^m*(m + 1)*log(e) - i^m*n)*B*d)*x)*(d*x + c)^m)/(((b^2*c*g^
(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(
m + 2)*n^2)*B^4)*(b*x + a)^m*log((b*x + a)^n)^2 + ((b^2*c*g^(m + 2)*n^2 - a
*b*d*g^(m + 2)*n^2)*B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*B^4
)*(b*x + a)^m*log((d*x + c)^n)^2 + 2*((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2
)*n^2)*A*B^3 + (a*b*c*g^(m + 2)*n^2*log(e) - a^2*d*g^(m + 2)*n^2*log(e))*B^
4 + ((b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*A*B^3 + (b^2*c*g^(m + 2)*n
^2*log(e) - a*b*d*g^(m + 2)*n^2*log(e))*B^4)*x)*(b*x + a)^m*log((b*x + a)^n
) + ((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*A^2*B^2 + 2*(a*b*c*g^(m +
2)*n^2*log(e) - a^2*d*g^(m + 2)*n^2*log(e))*A*B^3 + (a*b*c*g^(m + 2)*n^2*lo
g(e)^2 - a^2*d*g^(m + 2)*n^2*log(e)^2)*B^4 + ((b^2*c*g^(m + 2)*n^2 - a*b*d*
g^(m + 2)*n^2)*A^2*B^2 + 2*(b^2*c*g^(m + 2)*n^2*log(e) - a*b*d*g^(m + 2)*n^
2*log(e))*A*B^3 + (b^2*c*g^(m + 2)*n^2*log(e)^2 - a*b*d*g^(m + 2)*n^2*log(e
)^2)*B^4)*x)*(b*x + a)^m - 2*(((b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*
B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*B^4)*(b*x + a)^m*log((b
*x + a)^n) + ((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*A*B^3 + (a*b*c*g^
(m + 2)*n^2*log(e) - a^2*d*g^(m + 2)*n^2*log(e))*B^4 + ((b^2*c*g^(m + 2)*n^
2 - a*b*d*g^(m + 2)*n^2)*A*B^3 + (b^2*c*g^(m + 2)*n^2*log(e) - a*b*d*g^(m +
 2)*n^2*log(e))*B^4)*x)*(b*x + a)^m)*log((d*x + c)^n))
```

Fricas [B] time = 0.547344, size = 1764, normalized size = 5.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -1/2*((B^2*a*c*g^2*n^2 + (B^2*b*d*g^2*n^2 - (A*B*b*d*g^2*m + A*B*b*d*g^2)*n
)*x^2 - (A*B*a*c*g^2*m + A*B*a*c*g^2)*n + ((B^2*b*c + B^2*a*d)*g^2*n^2 - ((
A*B*b*c + A*B*a*d)*g^2*m + (A*B*b*c + A*B*a*d)*g^2)*n)*x - ((B^2*b*d*g^2*m
+ B^2*b*d*g^2)*n*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2
)*n*x + (B^2*a*c*g^2*m + B^2*a*c*g^2)*n)*log(e) - ((B^2*b*d*g^2*m + B^2*b*d
*g^2)*n^2*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2)*n^2*x
 + (B^2*a*c*g^2*m + B^2*a*c*g^2)*n^2)*log((b*x + a)/(d*x + c)))*(b*g*x + a*
g)^(-m - 2)*e^(m*log(b*g*x + a*g) - m*log((b*x + a)/(d*x + c)) + m*log(i/g)
) - ((B^2*m^2 + 2*B^2*m + B^2)*n^2*log((b*x + a)/(d*x + c))^2 + A^2*m^2 + 2
*A^2*m + (B^2*m^2 + 2*B^2*m + B^2)*log(e)^2 + 2*(A*B*m^2 + 2*A*B*m + A*B)*n
*log((b*x + a)/(d*x + c)) + A^2 + 2*(A*B*m^2 + 2*A*B*m + (B^2*m^2 + 2*B^2*m
 + B^2)*n*log((b*x + a)/(d*x + c)) + A*B)*log(e))*Ei(-((B*m + B)*n*log((b*x
 + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*n))*e^((B*m*n*log(i/g) +
A*m + (B*m + B)*log(e) + A)/(B*n)))/((B^5*b*c - B^5*a*d)*g^2*n^5*log((b*x +
 a)/(d*x + c))^2 + (B^5*b*c - B^5*a*d)*g^2*n^3*log(e)^2 + 2*(A*B^4*b*c - A*
B^4*a*d)*g^2*n^4*log((b*x + a)/(d*x + c)) + (A^2*B^3*b*c - A^2*B^3*a*d)*g^2
*n^3 + 2*((B^5*b*c - B^5*a*d)*g^2*n^4*log((b*x + a)/(d*x + c)) + (A*B^4*b*c
 - A*B^4*a*d)*g^2*n^3)*log(e))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^{-m-2}(dix + ci)^m}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m/(B*log(e*((b*x + a)/(d*x +
 c))^n) + A)^3, x)
```

3.224 $\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=41

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n(p+1)(bc-ad)}$$

```
[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c - a*d)*n*(1 + p))
```

Rubi [A] time = 0.108104, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.029, Rules used = {2505}

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[Log[e*((a + b*x)/(c + d*x))^n]^p/((a + b*x)*(c + d*x)),x]

[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c - a*d)*n*(1 + p))
```

Rule 2505

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{h = Simplify[u*(a + b*x)*(c + d*x)]}
, Simp[(h*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c -
 a*d)), x] /; FreeQ[h, x]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]
```

Rubi steps

$$\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)}\,dx = \frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)n(1+p)}$$

Mathematica [A] time = 0.0263713, size = 40, normalized size = 0.98

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(p+1)(bcn-adn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[e*((a + b*x)/(c + d*x))^n]^p/((a + b*x)*(c + d*x)),x]

[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c*n - a*d*n)*(1 + p))
```

Maple [F] time = 0.861, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)} \left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{p} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x)
```

```
[Out] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{p}}{(bx+a)(dx+c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x, algorithm="maxima
")
```

```
[Out] integrate(log(e*((b*x + a)/(d*x + c))^n)^p/((b*x + a)*(d*x + c)), x)
```

Fricas [A] time = 0.537488, size = 153, normalized size = 3.73

$$\frac{\left(n\log\left(\frac{bx+a}{dx+c}\right)+\log\left(e\right)\right)\left(n\log\left(\frac{bx+a}{dx+c}\right)+\log\left(e\right)\right)^{p}}{(bc-ad)np+(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x, algorithm="fricas
")
```

```
[Out] (n*log((b*x + a)/(d*x + c)) + log(e))*(n*log((b*x + a)/(d*x + c)) + log(e))
^p/((b*c - a*d)*n*p + (b*c - a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(e*((b*x+a)/(d*x+c))**n)**p/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.27801, size = 63, normalized size = 1.54

$$\frac{\left(n\log\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)+1\right)^{p+1}}{(bcn-adn)\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] (n*log(b*x/(d*x + c) + a/(d*x + c)) + 1)^(p + 1)/((b*c*n - a*d*n)*(p + 1))
```

3.225 $\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ac+(bc+ad)x+bdx^2}\,dx$

Optimal. Leaf size=41

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n(p+1)(bc-ad)}$$

```
[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c - a*d)*n*(1 + p))
```

Rubi [A] time = 0.0414104, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.024, Rules used = {2505}

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[Log[e*((a + b*x)/(c + d*x))^n]^p/(a*c + (b*c + a*d)*x + b*d*x^2),x]
```

```
[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c - a*d)*n*(1 + p))
```

Rule 2505

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{h = Simplify[u*(a + b*x)*(c + d*x)]}
, Simp[(h*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1))/(p*r*(s + 1)*(b*c -
 a*d)), x] /; FreeQ[h, x]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]
```

Rubi steps

$$\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ac+(bc+ad)x+bdx^2}\,dx=\frac{\log^{1+p}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(bc-ad)n(1+p)}$$

Mathematica [A] time = 0.0114759, size = 40, normalized size = 0.98

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(p+1)(bcn-adn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[e*((a + b*x)/(c + d*x))^n]^p/(a*c + (b*c + a*d)*x + b*d*x^2),
x]
```

```
[Out] Log[e*((a + b*x)/(c + d*x))^n]^(1 + p)/((b*c*n - a*d*n)*(1 + p))
```

Maple [F] time = 1.394, size = 0, normalized size = 0.

$$\int \frac{1}{ac + (ad + bc)\,x + bdx^2} \left(\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x)
```

```
[Out] int(ln(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^p}{bdx^2 + ac + (bc + ad)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x, algorit
hm="maxima")
```

```
[Out] integrate(log(e*((b*x + a)/(d*x + c))^n)^p/(b*d*x^2 + a*c + (b*c + a*d)*x),
 x)
```

Fricas [A] time = 0.499326, size = 153, normalized size = 3.73

$$\frac{\left(n\log\left(\frac{bx+a}{dx+c}\right) + \log\left(e\right)\right)\left(n\log\left(\frac{bx+a}{dx+c}\right) + \log\left(e\right)\right)^p}{(bc - ad)np + (bc - ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x, algorit
hm="fricas")
```

```
[Out] (n*log((b*x + a)/(d*x + c)) + log(e))*(n*log((b*x + a)/(d*x + c)) + log(e))
^p/((b*c - a*d)*n*p + (b*c - a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(e*((b*x+a)/(d*x+c))**n)**p/(a*c+(a*d+b*c)*x+b*d*x**2),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.27922, size = 63, normalized size = 1.54

$$\frac{\left(n\log\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)+1\right)^{p+1}}{(bcn-adn)\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(e*((b*x+a)/(d*x+c))^n)^p/(a*c+(a*d+b*c)*x+b*d*x^2),x, algorit
hm="giac")
```

```
[Out] (n*log(b*x/(d*x + c) + a/(d*x + c)) + 1)^(p + 1)/((b*c*n - a*d*n)*(p + 1))
```

3.226 $\int (ag+bgx)^m(ci+dix)^{-2-m} (A + B\log (e(a + bx)^n(c + dx)^{-n}$

Optimal. Leaf size=193

$$\frac{(a + bx)e^{-\frac{A(m+1)}{Bn}}(g(a + bx))^m(i(c + dx))^{-m} (e(a + bx)^n(c + dx)^{-n})^{-\frac{m+1}{n}} (B\log (e(a + bx)^n(c + dx)^{-n}) + A)^p \left(-\frac{(m+1)(B\log(e(a+b}{B}\right.}{i^2(m + 1)(c + dx)(bc - ad)}$$

```
[Out] ((a + b*x)*(g*(a + b*x))^m*Gamma[1 + p, -(((1 + m)*(A + B*Log[(e*(a + b*x)^
n)/(c + d*x)^n]))/(B*n))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p)/((b*c
 - a*d)*E^((A*(1 + m))/(B*n))*i^2*(1 + m)*(c + d*x)*(i*(c + d*x))^m*((e*(a
+ b*x)^n)/(c + d*x)^n)^((1 + m)/n)*(-(((1 + m)*(A + B*Log[(e*(a + b*x)^n)/(
c + d*x)^n]))/(B*n)))^p)
```

Rubi [F] time = 0.811082, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int (ag + bgx)^m(ci + dix)^{-2-m} (A + B\log (e(a + bx)^n(c + dx)^{-n}))^p \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])^p,x]
```

```
[Out] Defer[Int][(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])^p, x]
```

Rubi steps

$$\int (226c + 226dx)^{-2-m}(ag + bgx)^m (A + B\log (e(a + bx)^n(c + dx)^{-n}))^p \, dx = \int (226c + 226dx)^{-2-m}(ag + bgx)^m (A + B\log$$

Mathematica [F] time = 0.438299, size = 0, normalized size = 0.

$$\int (ag + bgx)^m(ci + dix)^{-2-m} (A + B\log (e(a + bx)^n(c + dx)^{-n}))^p \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^m*(c*i + d*i*x)^(-2 - m)*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p, x]
```

Maple [F] time = 3.535, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^m (dix + ci)^{-2-m} \left(A + B\ln\left(\frac{e\,(bx + a)^n}{(dx + c)^n}\right)\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

```
[Out] int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{m}(dix+ci)^{-m-2}\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)^{p}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log((b*x + a)^n*e/(d*x
+ c)^n) + A)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bgx+ag\right)^{m}(dix+ci)^{-m-2}\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)^{p},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log((b*x + a)^n*e/(d*x +
 c)^n) + A)^p, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n)))**p,x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.227 $\int (ag+bgx)^{-2-m}(ci+dix)^m \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right.$

Optimal. Leaf size=194

$$-\frac{(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e(a+bx)^n(c+dx)^{-n}\right)^{\frac{m+1}{n}}\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^p\left(\frac{(m+1)(B\log(e(a}{}\right.}{i^2(m+1)(c+dx)(bc-ad)}$$

```
[Out] -((E^((A*(1 + m))/(B*n))*(a + b*x)*(g*(a + b*x))^(-2 - m)*(i*(c + d*x))^(2
+ m)*((e*(a + b*x)^n)/(c + d*x)^n)^((1 + m)/n)*Gamma[1 + p, ((1 + m)*(A + B
*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(B*n)]*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])^p)/((b*c - a*d)*i^2*(1 + m)*(c + d*x)*(((1 + m)*(A + B*Log[(e*(a +
 b*x)^n)/(c + d*x)^n]))/(B*n))^p))
```

Rubi [F] time = 0.710533, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])^p,x]
```

```
[Out] Defer[Int][(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])^p, x]
```

Rubi steps

$$\int (227c+227dx)^m(ag+bgx)^{-2-m}\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx=\int (227c+227dx)^m(ag+bgx)^{-2-m}\left(A+B\,\mathrm{lo}\right.$$

Mathematica [F] time = 0.397671, size = 0, normalized size = 0.

$$\int (ag+bgx)^{-2-m}(ci+dix)^m\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^p\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p,x]
```

```
[Out] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^p, x]
```

Maple [F] time = 3.481, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{-2-m}(dix+ci)^m\left(A+B\ln\left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{-m-2} (dix + ci)^m \left(B\log\left(\frac{(bx + a)^n e}{(dx + c)^n}\right) + A\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log((b*x + a)^n*e/(d*x
+ c)^n) + A)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bgx + ag\right)^{-m-2} (dix + ci)^m \left(B\log\left(\frac{(bx + a)^n e}{(dx + c)^n}\right) + A\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log((b*x + a)^n*e/(d*x +
 c)^n) + A)^p, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n)))**p,x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.228 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=45

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^4}{4Bn(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/(4*B*(b*c - a*d)*n)
```

Rubi [A] time = 0.11773, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {6686}

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^4}{4Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/(4*B*(b*c - a*d)*n)
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(c+dx)}\,dx=\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{4B(bc-ad)n}$$

Mathematica [A] time = 0.0198009, size = 43, normalized size = 0.96

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^4}{4(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((a + b*x)*(c + d*x)),
x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/(4*(b*B*c*n - a*B*d*n))
```

Maple [C] time = 18.661, size = 64288, normalized size = 1428.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.44248, size = 1034, normalized size = 22.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm
="maxima")
```

```
[Out] B^3*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e
/(d*x + c)^n)^3 + 3*A*B^2*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a
*d))*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*A^2*B*(log(b*x + a)/(b*c - a*d) -
 log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e/(d*x + c)^n) - 1/4*B^3*(6*(e*n
*log(b*x + a)^2 - 2*e*n*log(b*x + a)*log(d*x + c) + e*n*log(d*x + c)^2)*log
((b*x + a)^n*e/(d*x + c)^n)^2/((b*c - a*d)*e) - (4*(e^2*n^2*log(b*x + a)^3
- 3*e^2*n^2*log(b*x + a)^2*log(d*x + c) + 3*e^2*n^2*log(b*x + a)*log(d*x +
c)^2 - e^2*n^2*log(d*x + c)^3)*log((b*x + a)^n*e/(d*x + c)^n)/((b*c - a*d)*
e) - (e^3*n^3*log(b*x + a)^4 - 4*e^3*n^3*log(b*x + a)^3*log(d*x + c) + 6*e^
3*n^3*log(b*x + a)^2*log(d*x + c)^2 - 4*e^3*n^3*log(b*x + a)*log(d*x + c)^3
 + e^3*n^3*log(d*x + c)^4)/((b*c - a*d)*e^2))/e) + A^3*(log(b*x + a)/(b*c -
 a*d) - log(d*x + c)/(b*c - a*d)) - A*B^2*(3*(e*n*log(b*x + a)^2 - 2*e*n*lo
g(b*x + a)*log(d*x + c) + e*n*log(d*x + c)^2)*log((b*x + a)^n*e/(d*x + c)^n
)/((b*c - a*d)*e) - (e^2*n^2*log(b*x + a)^3 - 3*e^2*n^2*log(b*x + a)^2*log(
d*x + c) + 3*e^2*n^2*log(b*x + a)*log(d*x + c)^2 - e^2*n^2*log(d*x + c)^3)/
((b*c - a*d)*e^2)) - 3/2*(e*n*log(b*x + a)^2 - 2*e*n*log(b*x + a)*log(d*x +
 c) + e*n*log(d*x + c)^2)*A^2*B/((b*c - a*d)*e)
```

Fricas [B] time = 0.522504, size = 906, normalized size = 20.13

$$\frac{B^3n^3\log(bx+a)^4 + B^3n^3\log(dx+c)^4 + 4\left(B^3n^2\log(e) + AB^2n^2\right)\log(bx+a)^3 - 4\left(B^3n^3\log(bx+a) + B^3n^2\log(e)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm
="fricas")
```

```
[Out] 1/4*(B^3*n^3*log(b*x + a)^4 + B^3*n^3*log(d*x + c)^4 + 4*(B^3*n^2*log(e) +
A*B^2*n^2)*log(b*x + a)^3 - 4*(B^3*n^3*log(b*x + a) + B^3*n^2*log(e) + A*B^
2*n^2)*log(d*x + c)^3 + 6*(B^3*n*log(e)^2 + 2*A*B^2*n*log(e) + A^2*B*n)*log
(b*x + a)^2 + 6*(B^3*n^3*log(b*x + a)^2 + B^3*n*log(e)^2 + 2*A*B^2*n*log(e)
 + A^2*B*n + 2*(B^3*n^2*log(e) + A*B^2*n^2)*log(b*x + a))*log(d*x + c)^2 +
4*(B^3*log(e)^3 + 3*A*B^2*log(e)^2 + 3*A^2*B*log(e) + A^3)*log(b*x + a) - 4
*(B^3*n^3*log(b*x + a)^3 + B^3*log(e)^3 + 3*A*B^2*log(e)^2 + 3*A^2*B*log(e)
 + A^3 + 3*(B^3*n^2*log(e) + A*B^2*n^2)*log(b*x + a)^2 + 3*(B^3*n*log(e)^2
+ 2*A*B^2*n*log(e) + A^2*B*n)*log(b*x + a))*log(d*x + c))/(b*c - a*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm
="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/((b*x + a)*(d*x + c)), x
)
```

3.229 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=45

$$\frac{(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)^3}{3Bn(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(3*B*(b*c - a*d)*n)
```

Rubi [A] time = 0.112263, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {6686}

$$\frac{(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)^3}{3Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(3*B*(b*c - a*d)*n)
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))^2}{(a+bx)(c+dx)}\,dx=\frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))^3}{3B(bc-ad)n}$$

Mathematica [A] time = 0.0154685, size = 43, normalized size = 0.96

$$\frac{(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)^3}{3(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((a + b*x)*(c + d*x)),
x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(3*(b*B*c*n - a*B*d*n))
```

Maple [C] time = 2.427, size = 11062, normalized size = 245.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.36915, size = 522, normalized size = 11.6

$$B^2\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+2\,AB\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2\left(\frac{\log(bx+}{bc-ad}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x, algorithm
="maxima")
```

```
[Out] B^2*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e
/(d*x + c)^n)^2 + 2*A*B*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d
))*log((b*x + a)^n*e/(d*x + c)^n) + A^2*(log(b*x + a)/(b*c - a*d) - log(d*x
 + c)/(b*c - a*d)) - 1/3*B^2*(3*(e*n*log(b*x + a)^2 - 2*e*n*log(b*x + a)*lo
g(d*x + c) + e*n*log(d*x + c)^2)*log((b*x + a)^n*e/(d*x + c)^n)/((b*c - a*d
)*e) - (e^2*n^2*log(b*x + a)^3 - 3*e^2*n^2*log(b*x + a)^2*log(d*x + c) + 3*
e^2*n^2*log(b*x + a)*log(d*x + c)^2 - e^2*n^2*log(d*x + c)^3)/((b*c - a*d)*
e^2)) - (e*n*log(b*x + a)^2 - 2*e*n*log(b*x + a)*log(d*x + c) + e*n*log(d*x
 + c)^2)*A*B/((b*c - a*d)*e)
```

Fricas [B] time = 0.484184, size = 466, normalized size = 10.36

$$\frac{B^2n^2\log(bx+a)^3-B^2n^2\log(dx+c)^3+3\left(B^2n\log(e)+ABn\right)\log(bx+a)^2+3\left(B^2n^2\log(bx+a)+B^2n\log(e)+ABn\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x, algorithm
="fricas")
```

```
[Out] 1/3*(B^2*n^2*log(b*x + a)^3 - B^2*n^2*log(d*x + c)^3 + 3*(B^2*n*log(e) + A*
B*n)*log(b*x + a)^2 + 3*(B^2*n^2*log(b*x + a) + B^2*n*log(e) + A*B*n)*log(d
*x + c)^2 + 3*(B^2*log(e)^2 + 2*A*B*log(e) + A^2)*log(b*x + a) - 3*(B^2*n^2
*log(b*x + a)^2 + B^2*log(e)^2 + 2*A*B*log(e) + A^2 + 2*(B^2*n*log(e) + A*B
*n)*log(b*x + a))*log(d*x + c))/(b*c - a*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)/(d*x+c),x, algorithm
="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/((b*x + a)*(d*x + c)), x
)
```

3.230 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=45

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^2}{2Bn(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(2*B*(b*c - a*d)*n)
```

Rubi [A] time = 0.082411, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.026, Rules used = {6686}

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^2}{2Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(2*B*(b*c - a*d)*n)
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(c+dx)}\,dx = \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{2B(bc-ad)n}$$

Mathematica [A] time = 0.0121338, size = 43, normalized size = 0.96

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^2}{2(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(2*(b*B*c*n - a*B*d*n))
```

Maple [C] time = 0.615, size = 1152, normalized size = 25.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x)
```

```
[Out] 1/(a*d-b*c)*A*ln(-d*x-c)-1/(a*d-b*c)*A*ln(b*x+a)-1/2*I/(a*d-b*c)*B*Pi*ln(-d
*x-c)*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I
*(b*x+a)^n/((d*x+c)^n))^3-1/2*I/(a*d-b*c)*B*Pi*ln(-d*x-c)*csgn(I*e/((d*x+c)
^n)*(b*x+a)^n)^3+1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)^3-1/2*I/(a*d-b*c)*B*Pi*ln(-d*x-c)*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n)
)*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*(b*x+
a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/(a*d-b*c)*B*P
i*ln(-d*x-c)*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)+1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c
)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/(a*d-b*c)*B*n*ln(b*x+a)*ln(d*x+c)+1
/(a*d-b*c)*B*ln((b*x+a)^n)*ln(d*x+c)+1/(a*d-b*c)*B*ln(e)*ln(-d*x-c)-1/(a*d-
b*c)*B*ln(e)*ln(b*x+a)-1/(a*d-b*c)*B*ln((b*x+a)^n)*ln(b*x+a)+1/2/(a*d-b*c)*
B*n*ln(d*x+c)^2+1/2/(a*d-b*c)*B*n*ln(b*x+a)^2+B*(ln(b*x+a)-ln(d*x+c))/(a*d-
b*c)*ln((d*x+c)^n)-1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I/((d*x+c)^n))*csgn(
I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/(a*d-b*c)*B*Pi*ln(-d*x-c)*csgn(I*(b*x+a)^n
/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/(a*d-b*c)*B*Pi*ln(b*x
+a)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/(
a*d-b*c)*B*Pi*ln(-d*x-c)*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/
(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/
(a*d-b*c)*B*Pi*ln(-d*x-c)*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2
-1/2*I/(a*d-b*c)*B*Pi*ln(b*x+a)*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)
^n))^2+1/2*I/(a*d-b*c)*B*Pi*ln(-d*x-c)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n
/((d*x+c)^n))^2
```

Maxima [B] time = 1.26903, size = 204, normalized size = 4.53

$$B\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)-\frac{\left(en\log(bx+a)^2-2\,en\log(bx+\right.}{2\,(bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x, algorithm="
maxima")
```

```
[Out] B*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e/(
d*x + c)^n) + A*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d)) - 1/2
*(e*n*log(b*x + a)^2 - 2*e*n*log(b*x + a)*log(d*x + c) + e*n*log(d*x + c)^2
)*B/((b*c - a*d)*e)
```

Fricas [A] time = 0.471431, size = 192, normalized size = 4.27

$$\frac{Bn\log(bx+a)^2+Bn\log(dx+c)^2+2\,(B\log(e)+A)\log(bx+a)-2\,(Bn\log(bx+a)+B\log(e)+A)\log(dx+c)}{2\,(bc-ad)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x, algorithm="
fricas")
```

```
[Out] 1/2*(B*n*log(b*x + a)^2 + B*n*log(d*x + c)^2 + 2*(B*log(e) + A)*log(b*x + a
) - 2*(B*n*log(b*x + a) + B*log(e) + A)*log(d*x + c))/(b*c - a*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x, algorithm="
giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/((b*x + a)*(d*x + c)), x)
```

3.231 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=41

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bn(bc-ad)}$$

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*n)
```

Rubi [A] time = 0.122027, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {6684}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*n)
```

Rule 6684

```
Int[(u_)/(y_), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q*L
og[RemoveContent[y, x]], x] /;  !FalseQ[q]]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)n}$$

Mathematica [A] time = 0.0874408, size = 39, normalized size = 0.95

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bBcn-aBdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),
x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(b*B*c*n - a*B*d*n)
```

Maple [C] time = 0.407, size = 368, normalized size = 9.

$$-\frac{1}{Bn\left(ad-bc\right)}\ln\left(\ln\left(\left(dx+c\right)^n\right)-\frac{1}{2B}\left(-iB\pi\,\text{csgn}\left(ie\right)\text{csgn}\left(\frac{i\left(bx+a\right)^n}{\left(dx+c\right)^n}\right)\text{csgn}\left(\frac{ie\left(bx+a\right)^n}{\left(dx+c\right)^n}\right)+iB\pi\,\text{csgn}\left(ie\right)\left(\text{csgn}\left(\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/B/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*
x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*
(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)+2*B
*ln((b*x+a)^n)+2*A)/B)
```

Maxima [A] time = 1.72913, size = 66, normalized size = 1.61

$$\frac{\log\left(-\frac{B\log\left((bx+a)^n\right)-B\log\left((dx+c)^n\right)+B\log(e)+A}{B}\right)}{(bcn-adn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + B*log(e) + A)/B)/((b*c*n -
a*d*n)*B)
```

Fricas [A] time = 0.491652, size = 105, normalized size = 2.56

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-B\log\left(e\right)-A\right)}{(Bbc-Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - B*log(e) - A)/((B*b*c - B*a*d)*n
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.28151, size = 51, normalized size = 1.24

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcn-Badn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*n - B*a*d*n)
```

3.232 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2} dx$

Optimal. Leaf size=43

$$-\frac{1}{Bn(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}$$

```
[Out] -(1/(B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))
```

Rubi [A] time = 0.121829, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {6686}

$$-\frac{1}{Bn(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2),x]
```

```
[Out] -(1/(B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2} dx = -\frac{1}{B(bc-ad)n\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}$$

Mathematica [A] time = 0.0203908, size = 41, normalized size = 0.95

$$-\frac{1}{(bBcn-aBdn)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2
),x]
```

```
[Out] -(1/((b*B*c*n - a*B*d*n)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))
```

Maple [C] time = 0.399, size = 366, normalized size = 8.5

$$2\frac{1}{Bn(ad-bc)}\left(2A+2B\ln(e)+2B\ln\left((bx+a)^n\right)-2B\ln\left((dx+c)^n\right)-iB\pi\,\mathrm{csgn}\left(i(bx+a)^n\right)\mathrm{csgn}\left(\frac{i}{(dx+c)^n}\right)\mathrm{csgn}\left(\frac{i}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] 2/B/n/(a*d-b*c)/(2*A+2*B*ln(e)+2*B*ln((b*x+a)^n)-2*B*ln((d*x+c)^n)-I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*csgn(I/((d*x+c)^n))
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B
*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*csgn(I*(b*x+a)^n
/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^3)
```

Maxima [A] time = 1.80463, size = 109, normalized size = 2.53

$$-\frac{1}{(bcn-adn)B^2\log\left((bx+a)^n\right)-(bcn-adn)B^2\log\left((dx+c)^n\right)+(bcn-adn)AB+(bcn\log(e)-adn\log(e))B^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorit
hm="maxima")
```

```
[Out] -1/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c
)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2)
```

Fricas [A] time = 0.507261, size = 185, normalized size = 4.3

$$-\frac{1}{\left(B^2bc-B^2ad\right)n^2\log(bx+a)-\left(B^2bc-B^2ad\right)n^2\log(dx+c)+\left(B^2bc-B^2ad\right)n\log(e)+(ABbc-ABad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorit
hm="fricas")
```

```
[Out] -1/((B^2*b*c - B^2*a*d)*n^2*log(b*x + a) - (B^2*b*c - B^2*a*d)*n^2*log(d*x
+ c) + (B^2*b*c - B^2*a*d)*n*log(e) + (A*B*b*c - A*B*a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.29514, size = 128, normalized size = 2.98

$$-\frac{1}{B^2bcn^2\log(bx+a)-B^2adn^2\log(bx+a)-B^2bcn^2\log(dx+c)+B^2adn^2\log(dx+c)+ABbcn+B^2bcn-ABadn-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorit
hm="giac")
```

```
[Out] -1/(B^2*b*c*n^2*log(b*x + a) - B^2*a*d*n^2*log(b*x + a) - B^2*b*c*n^2*log(d
*x + c) + B^2*a*d*n^2*log(d*x + c) + A*B*b*c*n + B^2*b*c*n - A*B*a*d*n - B^
2*a*d*n)
```

3.233 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}\,dx$

Optimal. Leaf size=45

$$-\frac{1}{2Bn(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}$$

```
[Out] -1/(2*B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)
```

Rubi [A] time = 0.122359, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {6686}

$$-\frac{1}{2Bn(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3),x]
```

```
[Out] -1/(2*B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}\,dx = -\frac{1}{2B(bc-ad)n\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}$$

Mathematica [A] time = 0.0196387, size = 43, normalized size = 0.96

$$-\frac{1}{2(bBcn-aBdn)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3
),x]
```

```
[Out] -1/(2*(b*B*c*n - a*B*d*n)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)
```

Maple [C] time = 0.404, size = 366, normalized size = 8.1

$$2\,\frac{1}{Bn\,(ad-bc)}\left(2\,A+2\,B\ln(e)+2\,B\ln\left((bx+a)^n\right)-2\,B\ln\left((dx+c)^n\right)-iB\pi\,\mathrm{csgn}\left(i\,(bx+a)^n\right)\mathrm{csgn}\left(\frac{i}{(dx+c)^n}\right)\mathrm{csgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] 2/B/n/(a*d-b*c)/(2*A+2*B*ln(e)+2*B*ln((b*x+a)^n)-2*B*ln((d*x+c)^n)-I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*c
sgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*csgn(I/((d*x+c)^n))
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B
*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*csgn(I*(b*x+a)^n
/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^3)^2
```

Maxima [B] time = 2.09508, size = 297, normalized size = 6.6

$$-\frac{}{2\left((bcn-adn)B^3\log\left((bx+a)^n\right)^2+(bcn-adn)B^3\log\left((dx+c)^n\right)^2+(bcn-adn)A^2B+2\left(bcn\log(e)-adn\log(e)\right)AB^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorit
hm="maxima")
```

```
[Out] -1/2/((b*c*n - a*d*n)*B^3*log((b*x + a)^n)^2 + (b*c*n - a*d*n)*B^3*log((d*x
 + c)^n)^2 + (b*c*n - a*d*n)*A^2*B + 2*(b*c*n*log(e) - a*d*n*log(e))*A*B^2
+ (b*c*n*log(e)^2 - a*d*n*log(e)^2)*B^3 + 2*((b*c*n - a*d*n)*A*B^2 + (b*c*n
*log(e) - a*d*n*log(e))*B^3)*log((b*x + a)^n) - 2*((b*c*n - a*d*n)*B^3*log(
(b*x + a)^n) + (b*c*n - a*d*n)*A*B^2 + (b*c*n*log(e) - a*d*n*log(e))*B^3)*l
og((d*x + c)^n))
```

Fricas [B] time = 0.495569, size = 520, normalized size = 11.56

$$-\frac{}{2\left(\left(B^3bc-B^3ad\right)n^3\log(bx+a)^2+\left(B^3bc-B^3ad\right)n^3\log(dx+c)^2+\left(B^3bc-B^3ad\right)n\log(e)^2+2\left(AB^2bc-AB^2ad\right)n\log\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorit
hm="fricas")
```

```
[Out] -1/2/((B^3*b*c - B^3*a*d)*n^3*log(b*x + a)^2 + (B^3*b*c - B^3*a*d)*n^3*log(
d*x + c)^2 + (B^3*b*c - B^3*a*d)*n*log(e)^2 + 2*(A*B^2*b*c - A*B^2*a*d)*n*l
og(e) + (A^2*B*b*c - A^2*B*a*d)*n + 2*((B^3*b*c - B^3*a*d)*n^2*log(e) + (A*
B^2*b*c - A*B^2*a*d)*n^2)*log(b*x + a) - 2*((B^3*b*c - B^3*a*d)*n^3*log(b*x
 + a) + (B^3*b*c - B^3*a*d)*n^2*log(e) + (A*B^2*b*c - A*B^2*a*d)*n^2)*log(d
*x + c))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.23947, size = 406, normalized size = 9.02

$$-\frac{}{2\left(B^3bcn^3\log\left(bx+a\right)^2-B^3adn^3\log\left(bx+a\right)^2-2\,B^3bcn^3\log\left(bx+a\right)\log\left(dx+c\right)+2\,B^3adn^3\log\left(bx+a\right)\log\left(dx+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorit
hm="giac")
```

```
[Out] -1/2/(B^3*b*c*n^3*log(b*x + a)^2 - B^3*a*d*n^3*log(b*x + a)^2 - 2*B^3*b*c*n
^3*log(b*x + a)*log(d*x + c) + 2*B^3*a*d*n^3*log(b*x + a)*log(d*x + c) + B^
3*b*c*n^3*log(d*x + c)^2 - B^3*a*d*n^3*log(d*x + c)^2 + 2*A*B^2*b*c*n^2*log
(b*x + a) + 2*B^3*b*c*n^2*log(b*x + a) - 2*A*B^2*a*d*n^2*log(b*x + a) - 2*B
^3*a*d*n^2*log(b*x + a) - 2*A*B^2*b*c*n^2*log(d*x + c) - 2*B^3*b*c*n^2*log(
d*x + c) + 2*A*B^2*a*d*n^2*log(d*x + c) + 2*B^3*a*d*n^2*log(d*x + c) + A^2*
B*b*c*n + 2*A*B^2*b*c*n + B^3*b*c*n - A^2*B*a*d*n - 2*A*B^2*a*d*n - B^3*a*d
*n)
```

3.234 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=49

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{Bn(p+1)(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*n*(1 + p))
```

Rubi [A] time = 0.149343, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {6686}

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{Bn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a + b*x)*(c + d*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*n*(1 + p))
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{(a+bx)(c+dx)}\,dx = \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)n(1+p)}$$

Mathematica [A] time = 0.0275035, size = 47, normalized size = 0.96

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{(p+1)(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a + b*x)*(c + d*x)),
x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/((b*B*c*n - a*B*d*n)*(1 +
p))
```

Maple [F] time = 2.183, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)}\left(A+B\ln\left(\frac{e(bx+a)^n}{(dx+c)^n}\right)\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^p}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm
="maxima")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*x + a)*(d*x + c)), x
)
```

Fricas [A] time = 0.544868, size = 204, normalized size = 4.16

$$\frac{(Bn\log(bx+a)-Bn\log(dx+c)+B\log(e)+A)(Bn\log(bx+a)-Bn\log(dx+c)+B\log(e)+A)^p}{(Bbc-Bad)np+(Bbc-Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm
="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)*(B*n*log(b*x + a) - B*
n*log(d*x + c) + B*log(e) + A)^p/((B*b*c - B*a*d)*n*p + (B*b*c - B*a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^p}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm
="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*x + a)*(d*x + c)), x
)
```

3.235 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{(af+bfx)(cg+dgx)}\,dx$

Optimal. Leaf size=55

$$\frac{(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)^{p+1}}{Bfgn(p+1)(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*f*g*n*(1 +
p))
```

Rubi [A] time = 0.215841, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 46, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.022, Rules used = {6686}

$$\frac{(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)^{p+1}}{Bfgn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a*f + b*f*x)*(c*g + d*g*x)
),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*f*g*n*(1 +
p))
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))^p}{(af+bfx)(cg+dgx)}\,dx=\frac{(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right))^{1+p}}{B(bc-ad)fgn(1+p)}$$

Mathematica [A] time = 0.046216, size = 51, normalized size = 0.93

$$\frac{(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)^{p+1}}{(p+1)(bBcfgn-aBdfgn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a*f + b*f*x)*(c*g +
d*g*x)),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/((b*B*c*f*g*n - a*B*d*f*g*
n)*(1 + p))
```

Maple [F] time = 2.22, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bxf+af\right)\left(dgx+cg\right)}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\right)^{p}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)^{p}}{\left(bfx+af\right)\left(dgx+cg\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, a
lgorithm="maxima")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*f*x + a*f)*(d*g*x +
c*g)), x)
```

Fricas [A] time = 0.511055, size = 215, normalized size = 3.91

$$\frac{(Bn\log(bx+a)-Bn\log(dx+c)+B\log(e)+A)(Bn\log(bx+a)-Bn\log(dx+c)+B\log(e)+A)^{p}}{(Bbc-Bad)fgnp+(Bbc-Bad)fgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, a
lgorithm="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)*(B*n*log(b*x + a) - B*
n*log(d*x + c) + B*log(e) + A)^p/((B*b*c - B*a*d)*f*g*n*p + (B*b*c - B*a*d)
*f*g*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(b*f*x+a*f)/(d*g*x+c*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^p}{\left(bfx+af\right)\left(dgx+cg\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, a
lgorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*f*x + a*f)*(d*g*x +
c*g)), x)
```

3.236 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{acf+(bc+ad)fx+bdfx^2}\,dx$

Optimal. Leaf size=52

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{Bfn(p+1)(bc-ad)}$$

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*f*n*(1 + p)
)
```

Rubi [A] time = 0.106263, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.02, Rules used = {6686}

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{Bfn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/(a*c*f + (b*c + a*d)*f*x + b
*d*f*x^2),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(B*(b*c - a*d)*f*n*(1 + p)
)
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^p}{acf+(bc+ad)fx+bdfx^2}\,dx=\frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)fn(1+p)}$$

Mathematica [A] time = 0.0116366, size = 50, normalized size = 0.96

$$\frac{(B\log(e(a+bx)^n(c+dx)^{-n})+A)^{p+1}}{f(p+1)(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/(a*c*f + (b*c + a*d)*f
*x + b*d*f*x^2),x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/(f*(b*B*c*n - a*B*d*n)*(1
+ p))
```

Maple [F] time = 2.884, size = 0, normalized size = 0.

$$\int \frac{1}{acf + (ad + bc)fx + bdfx^2}\left(A + B\ln\left(\frac{e(bx + a)^n}{(dx + c)^n}\right)\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^p}{bdfx^2 + acf + (bc + ad)fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x
^2),x, algorithm="maxima")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/(b*d*f*x^2 + a*c*f + (b*
c + a*d)*f*x), x)
```

Fricas [A] time = 0.546326, size = 209, normalized size = 4.02

$$\frac{(Bn\log(bx + a) - Bn\log(dx + c) + B\log(e) + A)(Bn\log(bx + a) - Bn\log(dx + c) + B\log(e) + A)^p}{(Bbc - Bad)fnp + (Bbc - Bad)fn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x
^2),x, algorithm="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)*(B*n*log(b*x + a) - B*
n*log(d*x + c) + B*log(e) + A)^p/((B*b*c - B*a*d)*f*n*p + (B*b*c - B*a*d)*f
*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(a*c*f+(a*d+b*c)*f*x+b*d*f
*x**2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^p}{bdfx^2+acf+(bc+ad)fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x
^2),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/(b*d*f*x^2 + a*c*f + (b*
c + a*d)*f*x), x)
```

3.237 $\int \frac{1}{(a+bx)(c+dx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=41

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bn(bc-ad)}$$

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*n)
```

Rubi [A] time = 0.122921, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {6684}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*n)
```

Rule 6684

```
Int[(u_)/(y_), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q*L
og[RemoveContent[y, x]], x] /;  !FalseQ[q]]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)n}$$

Mathematica [A] time = 0.0512614, size = 39, normalized size = 0.95

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bBcn-aBdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),
x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(b*B*c*n - a*B*d*n)
```

Maple [C] time = 0.069, size = 368, normalized size = 9.

$$-\frac{1}{Bn(ad-bc)}\ln\left(\ln\left((dx+c)^n\right)-\frac{1}{2B}\left(-iB\pi\,\mathrm{csgn}(ie)\,\mathrm{csgn}\left(\frac{i(bx+a)^n}{(dx+c)^n}\right)\mathrm{csgn}\left(\frac{ie(bx+a)^n}{(dx+c)^n}\right)+iB\pi\,\mathrm{csgn}(ie)\left(\mathrm{csgn}\left(\frac{i}{}\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/B/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*
x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*
(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)+2*B
*ln((b*x+a)^n)+2*A)/B)
```

Maxima [A] time = 1.50589, size = 66, normalized size = 1.61

$$\frac{\log\left(-\frac{B\log\left((bx+a)^n\right)-B\log\left((dx+c)^n\right)+B\log(e)+A}{B}\right)}{(bcn-adn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + B*log(e) + A)/B)/((b*c*n -
a*d*n)*B)
```

Fricas [A] time = 0.508597, size = 105, normalized size = 2.56

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-B\log\left(e\right)-A\right)}{(Bbc-Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - B*log(e) - A)/((B*b*c - B*a*d)*n
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

<u>Giac</u> [A] time = 1.16894, size = 51, normalized size = 1.24

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcn-Badn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm
="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*n - B*a*d*n)
```

3.238 $\int \frac{1}{(af+bfx)(cg+dgx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=47

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bfgn(bc-ad)}$$

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*f*g*n)
```

Rubi [A] time = 0.165762, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 46, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.022, Rules used = {6684}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bfgn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a*f + b*f*x)*(c*g + d*g*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])
),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*f*g*n)
```

Rule 6684

```
Int[(u_)/(y_), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q*L
og[RemoveContent[y, x]], x] /;  !FalseQ[q]]
```

Rubi steps

$$\int \frac{1}{(af+bfx)(cg+dgx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)fgn}$$

Mathematica [A] time = 0.123151, size = 43, normalized size = 0.91

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bBcfgn-aBdfgn}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*f + b*f*x)*(c*g + d*g*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*
x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(b*B*c*f*g*n - a*B*d*f*g*n)
```

Maple [C] time = 0.426, size = 374, normalized size = 8.

$$-\frac{1}{Bfgn\,(ad-bc)}\ln\left(\ln\left(\left(dx+c\right)^{n}\right)-\frac{1}{2B}\left(-iB\pi\,\mathrm{csgn}\left(ie\right)\mathrm{csgn}\left(\frac{i\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\mathrm{csgn}\left(\frac{ie\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)+iB\pi\,\mathrm{csgn}\left(ie\right)\left(\mathrm{csgn}\left(\frac{ie}{(}\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/B/f/g/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)
^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I
*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^
n))^2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csg
n(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)
+2*B*ln((b*x+a)^n)+2*A)/B)
```

Maxima [A] time = 1.73882, size = 72, normalized size = 1.53

$$\frac{\log\left(-\frac{B\log\left((bx+a)^n\right)-B\log\left((dx+c)^n\right)+B\log(e)+A}{B}\right)}{\left(bcfgn-adfgn\right)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, a
lgorithm="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + B*log(e) + A)/B)/((b*c*f*g*
n - a*d*f*g*n)*B)
```

Fricas [A] time = 0.513459, size = 111, normalized size = 2.36

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-B\log\left(e\right)-A\right)}{\left(Bbc-Bad\right)fgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, a
lgorithm="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - B*log(e) - A)/((B*b*c - B*a*d)*f
*g*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.21471, size = 57, normalized size = 1.21

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcfgn-Badfgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x+a*f)/(d*g*x+c*g)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, a
lgorithm="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*f*g*n - B*a*d*f*g*n
)
```

3.239 $\int \frac{1}{(acf+(bc+ad)fx+bdfx^2)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=44

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bfn(bc-ad)}$$

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*f*n)
```

Rubi [A] time = 0.0775872, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.02, Rules used = {6684}

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{Bfn(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a*c*f + (b*c + a*d)*f*x + b*d*f*x^2)*(A + B*Log[(e*(a + b*x)^n)/(c
+ d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(B*(b*c - a*d)*f*n)
```

Rule 6684

```
Int[(u_)/(y_), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q*L
og[RemoveContent[y, x]], x] /;  !FalseQ[q]]
```

Rubi steps

$$\int \frac{1}{\left(acf+(bc+ad)fx+bdfx^2\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\frac{\log\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}{B(bc-ad)fn}$$

Mathematica [A] time = 0.0544395, size = 42, normalized size = 0.95

$$\frac{\log\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{f(bBcn-aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*c*f + (b*c + a*d)*f*x + b*d*f*x^2)*(A + B*Log[(e*(a + b*x)^
n)/(c + d*x)^n])),x]
```

```
[Out] Log[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]]/(f*(b*B*c*n - a*B*d*n))
```

Maple [C] time = 0.418, size = 371, normalized size = 8.4

$$-\frac{1}{Bfn(ad-bc)}\ln\left(\ln\left((dx+c)^n\right)-\frac{1}{2B}\left(-iB\pi\,\mathrm{csgn}(ie)\,\mathrm{csgn}\left(\frac{i(bx+a)^n}{(dx+c)^n}\right)\mathrm{csgn}\left(\frac{ie(bx+a)^n}{(dx+c)^n}\right)+iB\pi\,\mathrm{csgn}(ie)\left(\mathrm{csgn}\left(\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/B/f/n/(a*d-b*c)*ln(ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n
/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(
b*x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(
I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)+2
*B*ln((b*x+a)^n)+2*A)/B)
```

Maxima [A] time = 1.78736, size = 69, normalized size = 1.57

$$\frac{\log\left(-\frac{B\log\left((bx+a)^n\right)-B\log\left((dx+c)^n\right)+B\log(e)+A}{B}\right)}{\left(bcfn-adfn\right)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n
))),x, algorithm="maxima")
```

```
[Out] log(-(B*log((b*x + a)^n) - B*log((d*x + c)^n) + B*log(e) + A)/B)/((b*c*f*n
- a*d*f*n)*B)
```

Fricas [A] time = 0.487774, size = 108, normalized size = 2.45

$$\frac{\log\left(-Bn\log\left(bx+a\right)+Bn\log\left(dx+c\right)-B\log\left(e\right)-A\right)}{\left(Bbc-Bad\right)fn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n
))),x, algorithm="fricas")
```

```
[Out] log(-B*n*log(b*x + a) + B*n*log(d*x + c) - B*log(e) - A)/((B*b*c - B*a*d)*f
*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x**2)/(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n))),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.22325, size = 54, normalized size = 1.23

$$\frac{\log\left(Bn\log\left(bx+a\right)-Bn\log\left(dx+c\right)+A+B\right)}{Bbcfn-Badfn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n
))),x, algorithm="giac")
```

```
[Out] log(B*n*log(b*x + a) - B*n*log(d*x + c) + A + B)/(B*b*c*f*n - B*a*d*f*n)
```

3.240 $\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log(e(a+bx)^n(c+dx)^{-n})}\,dx$

Optimal. Leaf size=88

$$\frac{(a+bx)^{m+1}(c+dx)^{-m-1}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{m+1}{n}}\operatorname{Ei}\left(\frac{(m+1)\log(e(a+bx)^n(c+dx)^{-n})}{n}\right)}{n(bc-ad)}$$

```
[Out] ((a + b*x)^(1 + m)*(c + d*x)^(-1 - m)*ExpIntegralEi[((1 + m)*Log[(e*(a + b*
x)^n)/(c + d*x)^n])/n])/((b*c - a*d)*n*((e*(a + b*x)^n)/(c + d*x)^n)^((1 +
m)/n))
```

Rubi [A] time = 0.10988, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.025, Rules used = {2510}

$$\frac{(a+bx)^{m+1}(c+dx)^{-m-1}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{m+1}{n}}\operatorname{Ei}\left(\frac{(m+1)\log(e(a+bx)^n(c+dx)^{-n})}{n}\right)}{n(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)^m*(c + d*x)^(-2 - m))/Log[(e*(a + b*x)^n)/(c + d*x)^n],x]
```


```
[Out] ((a + b*x)^(1 + m)*(c + d*x)^(-1 - m)*ExpIntegralEi[((1 + m)*Log[(e*(a + b*
x)^n)/(c + d*x)^n])/n])/((b*c - a*d)*n*((e*(a + b*x)^n)/(c + d*x)^n)^((1 +
m)/n))
```


Rule 2510

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/Log[(e_.)*((f_.
)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q)^r])/(p*r)])/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
 r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

Rubi steps

$$\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}\,dx = \frac{(a+bx)^{1+m}(c+dx)^{-1-m}\left(e(a+bx)^n(c+dx)^{-n}\right)^{-\frac{1+m}{n}}\operatorname{Ei}\left(\frac{(1+m)\log(e(a+bx)^n(c+dx)^{-n})}{n}\right)}{(bc-ad)n}$$

Mathematica [F] time = 0.359671, size = 0, normalized size = 0.

$$\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a + b*x)^m*(c + d*x)^(-2 - m))/Log[(e*(a + b*x)^n)/(c + d*x)^n]
,x]
```

```
[Out] Integrate[((a + b*x)^m*(c + d*x)^(-2 - m))/Log[(e*(a + b*x)^n)/(c + d*x)^n]
, x]
```

Maple [F] time = 1.237, size = 0, normalized size = 0.

$$\int (bx+a)^m (dx+c)^{-2-m} \left(\ln\left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*(d*x+c)^(-2-m)/ln(e*(b*x+a)^n/((d*x+c)^n)),x)
```

```
[Out] int((b*x+a)^m*(d*x+c)^(-2-m)/ln(e*(b*x+a)^n/((d*x+c)^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^m (dx+c)^{-m-2}}{\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)/log(e*(b*x+a)^n/((d*x+c)^n)),x, algorith
m="maxima")
```

```
[Out] integrate((b*x + a)^m*(d*x + c)^(-m - 2)/log((b*x + a)^n*e/(d*x + c)^n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{(bx+a)^m (dx+c)^{-m-2}}{\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)/log(e*(b*x+a)^n/((d*x+c)^n)),x, algorith
m="fricas")
```

```
[Out] integral((b*x + a)^m*(d*x + c)^(-m - 2)/log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*(d*x+c)**(-2-m)/ln(e*(b*x+a)**n/((d*x+c)**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^m(dx+c)^{-m-2}}{\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)/log(e*(b*x+a)^n/((d*x+c)^n)),x, algorith
m="giac")
```

```
[Out] integrate((b*x + a)^m*(d*x + c)^(-m - 2)/log((b*x + a)^n*e/(d*x + c)^n), x)
```

3.241 $\int \frac{(a+bx)^3}{(c+dx)^5 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=75

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \text{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^4(bc-ad)}$$

```
[Out] ((a + b*x)^4*ExpIntegralEi[(4*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(4/n)*(c + d*x)^4)
```

Rubi [A] time = 0.0753523, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.029, Rules used = {2510}

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \text{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^4(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3/((c + d*x)^5*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^4*ExpIntegralEi[(4*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(4/n)*(c + d*x)^4)
```

Rule 2510

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/Log[(e_.)*((f_.
)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q)^r])/(p*r)])/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
 r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

Rubi steps

$$\int \frac{(a+bx)^3}{(c+dx)^5 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \text{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^4}$$

Mathematica [A] time = 0.0266898, size = 75, normalized size = 1.

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \text{Ei}\left(\frac{4\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^4(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3/((c + d*x)^5*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^4*ExpIntegralEi[(4*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(4/n)*(c + d*x)^4)
```

Maple [F] time = 0.809, size = 0, normalized size = 0.

$$\int \frac{(bx+a)^3}{(dx+c)^5} \left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3/(d*x+c)^5/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((b*x+a)^3/(d*x+c)^5/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^3}{(dx+c)^5 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3/(d*x+c)^5/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxi
ma")
```

```
[Out] integrate((b*x + a)^3/((d*x + c)^5*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Fricas [A] time = 0.483609, size = 220, normalized size = 2.93

$$\frac{\text{log\_integral}\left(\frac{\left(b^4x^4+4\,ab^3x^3+6\,a^2b^2x^2+4\,a^3bx+a^4\right)e^{\frac{4}{n}}}{d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4}\right)}{(bc-ad)e^{\frac{4}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3/(d*x+c)^5/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fric
as")
```

```
[Out] log_integral((b^4*x^4 + 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x + a^4)*e^(4
/n)/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4))/((b*c - a*d)
*e^(4/n)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3/(d*x+c)**5/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^3}{(dx+c)^5 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3/(d*x+c)^5/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^3/((d*x + c)^5*log(e*((b*x + a)/(d*x + c))^n)), x)
```

3.242 $\int \frac{(a+bx)^2}{(c+dx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=75

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^3(bc-ad)}$$

```
[Out] ((a + b*x)^3*ExpIntegralEi[(3*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3)
```

Rubi [A] time = 0.0731964, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.029, Rules used = {2510}

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2/((c + d*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^3*ExpIntegralEi[(3*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3)
```

Rule 2510

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/Log[(e_.)*((f_.
)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q)^r])/(p*r)])/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
 r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

Rubi steps

$$\int \frac{(a+bx)^2}{(c+dx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^3}$$

Mathematica [A] time = 0.0240413, size = 75, normalized size = 1.

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \text{Ei}\left(\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2/((c + d*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^3*ExpIntegralEi[(3*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3)
```

Maple [F] time = 0.643, size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2}{(dx+c)^4} \left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2/(d*x+c)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((b*x+a)^2/(d*x+c)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2}{(dx+c)^4 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2/(d*x+c)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxi
ma")
```

```
[Out] integrate((b*x + a)^2/((d*x + c)^4*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Fricas [A] time = 0.475508, size = 177, normalized size = 2.36

$$\frac{\text{log\_integral}\left(\frac{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)e^{\frac{3}{n}}}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}{(bc-ad)e^{\frac{3}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2/(d*x+c)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fric
as")
```

```
[Out] log_integral((b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*e^(3/n)/(d^3*x^3 + 3
*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b*c - a*d)*e^(3/n)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2/(d*x+c)**4/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2}{(dx+c)^4 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((b*x + a)^2/((d*x + c)^4*log(e*((b*x + a)/(d*x + c))^n)), x)
```

3.243 $\int \frac{a+bx}{(c+dx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=75

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \text{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^2(bc-ad)}$$

```
[Out] ((a + b*x)^2*ExpIntegralEi[(2*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2)
```

Rubi [A] time = 0.0496571, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.03, Rules used = {2510}

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \text{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)/((c + d*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^2*ExpIntegralEi[(2*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2)
```

Rule 2510

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/Log[(e_.)*((f_.
)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q)^r])/(p*r)])/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
 r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

Rubi steps

$$\int \frac{a+bx}{(c+dx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \text{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^2}$$

Mathematica [A] time = 0.0197561, size = 75, normalized size = 1.

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \text{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)/((c + d*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)^2*ExpIntegralEi[(2*Log[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a
*d)*n*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2)
```

Maple [F] time = 0.457, size = 0, normalized size = 0.

$$\int \frac{bx+a}{(dx+c)^{3}}\left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)/(d*x+c)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((b*x+a)/(d*x+c)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx+a}{(dx+c)^{3}\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima
")
```

```
[Out] integrate((b*x + a)/((d*x + c)^3*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Fricas [A] time = 0.503823, size = 134, normalized size = 1.79

$$\frac{\operatorname{log\_integral}\left(\frac{\left(b^{2}x^{2}+2\,abx+a^{2}\right)e^{\frac{2}{n}}}{d^{2}x^{2}+2\,cdx+c^{2}}\right)}{(bc-ad)e^{\frac{2}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas
")
```

```
[Out] log_integral((b^2*x^2 + 2*a*b*x + a^2)*e^(2/n)/(d^2*x^2 + 2*c*d*x + c^2))/(
(b*c - a*d)*e^(2/n)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)**3/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx + a}{(dx + c)^3 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)/((d*x + c)^3*log(e*((b*x + a)/(d*x + c))^n)), x)
```

3.244 $\int \frac{1}{(c+dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx$

Optimal. Leaf size=72

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \text{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)(bc-ad)}$$

```
[Out] ((a + b*x)*ExpIntegralEi[Log[e*((a + b*x)/(c + d*x))^n]/n])/((b*c - a*d)*n*
(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

Rubi [A] time = 0.0315986, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.036, Rules used = {2493}

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \text{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)*ExpIntegralEi[Log[e*((a + b*x)/(c + d*x))^n]/n])/((b*c - a*d)*n*
(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

Rule 2493

```
Int[1/(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_
.))^(r_.)]*((g_.) + (h_.)*(x_))^2), x_Symbol] :> Simp[(b*(c + d*x)*(e*(f*(a
 + b*x)^p*(c + d*x)^q)^r)^(1/(p*r))*ExpIntegralEi[-(Log[e*(f*(a + b*x)^p*(c
 + d*x)^q)^r]/(p*r))])/(h*p*r*(b*c - a*d)*(g + h*x)), x] /; FreeQ[{a, b, c,
 d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[b
*g - a*h, 0]
```

Rubi steps

$$\int \frac{1}{(c+dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx = \frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \text{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)}$$

Mathematica [A] time = 0.0707403, size = 72, normalized size = 1.

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \text{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((a + b*x)*ExpIntegralEi[Log[e*((a + b*x)/(c + d*x))^n]/n])/((b*c - a*d)*n*
(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

Maple [F] time = 0.457, size = 0, normalized size = 0.

$$\int \frac{1}{(dx+c)^2}\left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*x+c)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int(1/(d*x+c)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dx+c)^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima")
```

```
[Out] integrate(1/((d*x + c)^2*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Fricas [A] time = 0.456603, size = 90, normalized size = 1.25

$$\frac{\mathrm{log\_integral}\left(\frac{(bx+a)e^{\left(\frac{1}{n}\right)}}{dx+c}\right)}{(bc-ad)e^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas")
```

```
[Out] log_integral((b*x + a)*e^(1/n)/(d*x + c))/((b*c - a*d)*e^(1/n)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)**2/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dx+c)^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate(1/((d*x + c)^2*log(e*((b*x + a)/(d*x + c))^n)), x)
```

3.245 $\int \frac{1}{(a+bx)(c+dx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=33

$$\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{n(bc-ad)}$$

```
[Out] Log[Log[e*((a + b*x)/(c + d*x))^n]]/((b*c - a*d)*n)
```

Rubi [A] time = 0.0749734, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.029, Rules used = {2504}

$$\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{n(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Log[Log[e*((a + b*x)/(c + d*x))^n]]/((b*c - a*d)*n)
```

Rule 2504

```
Int[(u_)/Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(
q_.))^(r_.)], x_Symbol] :> With[{h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp
[(h*Log[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]])/(p*r*(b*c - a*d)), x] /; Fre
eQ[h, x]] /; FreeQ[{a, b, c, d, e, f, p, q, r}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0]
```

Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)n}$$

Mathematica [A] time = 0.069878, size = 34, normalized size = 1.03

$$-\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{n(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)*(c + d*x)*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(Log[Log[e*((a + b*x)/(c + d*x))^n]]/((-(b*c) + a*d)*n))
```

Maple [F] time = 0.815, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)} \left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)/(d*x+c)/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int(1/(b*x+a)/(d*x+c)/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [A] time = 1.74459, size = 50, normalized size = 1.52

$$\frac{\log\left(-\log\left((bx+a)^n\right) + \log\left((dx+c)^n\right) - \log(e)\right)}{bcn - adn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima
")
```

```
[Out] log(-log((b*x + a)^n) + log((d*x + c)^n) - log(e))/(b*c*n - a*d*n)
```

Fricas [A] time = 0.486093, size = 78, normalized size = 2.36

$$\frac{\log\left(n\log\left(\frac{bx+a}{dx+c}\right) + \log(e)\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas
")
```

```
[Out] log(n*log((b*x + a)/(d*x + c)) + log(e))/((b*c - a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.17881, size = 43, normalized size = 1.3

$$\frac{\log\left(n\log\left(\frac{bx+a}{dx+c}\right)+1\right)}{bcn-adn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)/(d*x+c)/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] log(n*log((b*x + a)/(d*x + c)) + 1)/(b*c*n - a*d*n)
```

3.246 $\int \frac{1}{(a+bx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=71

$$\frac{(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} \text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)(bc-ad)}$$

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpIntegralEi[-(Log[e*((a + b
*x)/(c + d*x))^n]/n)])/((b*c - a*d)*n*(a + b*x))
```

Rubi [A] time = 0.0289577, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.036, Rules used = {2493}

$$\frac{(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} \text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpIntegralEi[-(Log[e*((a + b
*x)/(c + d*x))^n]/n)])/((b*c - a*d)*n*(a + b*x))
```

Rule 2493

```
Int[1/(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_
.))^(r_.)]*((g_.) + (h_.)*(x_))^2), x_Symbol] :> Simp[(b*(c + d*x)*(e*(f*(a
 + b*x)^p*(c + d*x)^q)^r)^(1/(p*r))*ExpIntegralEi[-(Log[e*(f*(a + b*x)^p*(c
 + d*x)^q)^r]/(p*r))])/(h*p*r*(b*c - a*d)*(g + h*x)), x] /; FreeQ[{a, b, c,
 d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[b
*g - a*h, 0]
```

Rubi steps

$$\int \frac{1}{(a+bx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx = \frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}(c+dx)\text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)}$$

Mathematica [A] time = 0.0688921, size = 71, normalized size = 1.

$$\frac{(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} \text{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x)^2*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpIntegralEi[-(Log[e*((a + b
*x)/(c + d*x))^n]/n)])/((b*c - a*d)*n*(a + b*x))
```

Maple [F] time = 0.44, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^2}\left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x+a)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int(1/(b*x+a)^2/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x + a)^2*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Fricas [A] time = 0.487622, size = 93, normalized size = 1.31

$$\frac{e^{\left(\frac{1}{n}\right)}\operatorname{log\_integral}\left(\frac{dx+c}{(bx+a)e^{\left(\frac{1}{n}\right)}}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas")
```

```
[Out] e^(1/n)*log_integral((d*x + c)/((b*x + a)*e^(1/n)))/((b*c - a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)**2/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x + a)^2*log(e*((b*x + a)/(d*x + c))^n)), x)
```

3.247 $\int \frac{c+dx}{(a+bx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$

Optimal. Leaf size=75

$$\frac{(c+dx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} \text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^2(bc-ad)}$$

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2*ExpIntegralEi[(-2*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^2)
```

Rubi [A] time = 0.0472205, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.03, Rules used = {2510}

$$\frac{(c+dx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} \text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x)/((a + b*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2*ExpIntegralEi[(-2*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^2)
```

Rule 2510

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/Log[(e_.)*((f_.
)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q)^r])/(p*r)])/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
 r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

Rubi steps

$$\int \frac{c+dx}{(a+bx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} (c+dx)^2 \text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^2}$$

Mathematica [A] time = 0.0165232, size = 75, normalized size = 1.

$$\frac{(c+dx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} \text{Ei}\left(-\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x)/((a + b*x)^3*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2*ExpIntegralEi[(-2*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^2)
```

Maple [F] time = 0.439, size = 0, normalized size = 0.

$$\int \frac{dx+c}{(bx+a)^3}\left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)/(b*x+a)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((d*x+c)/(b*x+a)^3/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx+c}{(bx+a)^3 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima
")
```

```
[Out] integrate((d*x + c)/((b*x + a)^3*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Fricas [A] time = 0.511544, size = 136, normalized size = 1.81

$$\frac{e^{\frac{2}{n}}\,\mathrm{log\_integral}\left(\frac{d^2x^2+2\,cdx+c^2}{\left(b^2x^2+2\,abx+a^2\right)e^{\frac{2}{n}}}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas
")
```

```
[Out] e^(2/n)*log_integral((d^2*x^2 + 2*c*d*x + c^2)/((b^2*x^2 + 2*a*b*x + a^2)*e
^(2/n)))/((b*c - a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)**3/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx + c}{(bx + a)^3 \log \left(e \left(\frac{bx+a}{dx+c}\right)^n\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)/((b*x + a)^3*log(e*((b*x + a)/(d*x + c))^n)), x)
```

3.248 $\int \frac{(c+dx)^2}{(a+bx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx$

Optimal. Leaf size=75

$$\frac{(c+dx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} \operatorname{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^3(bc-ad)}$$

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3*ExpIntegralEi[(-3*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^3)
```

Rubi [A] time = 0.0698958, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.029, Rules used = {2510}

$$\frac{(c+dx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} \operatorname{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x)^2/((a + b*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3*ExpIntegralEi[(-3*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^3)
```

Rule 2510

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/Log[(e_.)*((f_.
)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q)^r])/(p*r)])/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
 r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

Rubi steps

$$\int \frac{(c+dx)^2}{(a+bx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} \, dx = \frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} (c+dx)^3 \operatorname{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^3}$$

Mathematica [A] time = 0.0182585, size = 75, normalized size = 1.

$$\frac{(c+dx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} \operatorname{Ei}\left(-\frac{3\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x)^2/((a + b*x)^4*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((e*((a + b*x)/(c + d*x))^n)^(3/n)*(c + d*x)^3*ExpIntegralEi[(-3*Log[e*((a
+ b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^3)
```

Maple [F] time = 0.67, size = 0, normalized size = 0.

$$\int \frac{(dx+c)^2}{(bx+a)^4}\left(\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)^2/(b*x+a)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] int((d*x+c)^2/(b*x+a)^4/ln(e*((b*x+a)/(d*x+c))^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^2}{(bx+a)^4\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2/(b*x+a)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxi
ma")
```

```
[Out] integrate((d*x + c)^2/((b*x + a)^4*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Fricas [A] time = 0.520909, size = 180, normalized size = 2.4

$$\frac{e^{\frac{3}{n}}\,\mathrm{log\_integral}\left(\frac{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)e^{\frac{3}{n}}}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2/(b*x+a)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fric
as")
```

```
[Out] e^(3/n)*log_integral((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)/((b^3*x^3 +
3*a*b^2*x^2 + 3*a^2*b*x + a^3)*e^(3/n)))/((b*c - a*d)*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**2/(b*x+a)**4/ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^2}{(bx+a)^4 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((d*x + c)^2/((b*x + a)^4*log(e*((b*x + a)/(d*x + c))^n)), x)
```

3.249 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=361

$$\frac{24B^3n^3\mathrm{PolyLog}\left(4,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}+\frac{12B^2n^2\mathrm{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+\right.\right.}{h(bf-ag)}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (4*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])^3*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a +
 b*x))])/((b*f - a*g)*h) + (12*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)
^n])^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f -
 a*g)*h) + (24*B^3*n^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[4,
((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^4
*n^4*PolyLog[5, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a
*g)*h)
```

Rubi [B] time = 1.92566, antiderivative size = 1021, normalized size of antiderivative = 2.83, number of steps used = 20, number of rules used = 9, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.209, Rules used = {6742, 36, 31, 2503, 2502, 2315, 2506, 6610, 2508}

$$\frac{\log(a+bx)A^4}{(bf-ag)h}-\frac{\log(f+gx)A^4}{(bf-ag)h}-\frac{4B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)A^3}{(bf-ag)h}+\frac{4Bn\mathrm{PolyLog}\left(2,\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right.}{(bf-ag)h}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] (A^4*Log[a + b*x])/((b*f - a*g)*h) - (A^4*Log[f + g*x])/((b*f - a*g)*h) - (
4*A^3*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*
f - c*g)*(a + b*x)))])/((b*f - a*g)*h) - (6*A^2*B^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])/((b*f
- a*g)*h) - (4*A*B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*Log[-(((b*c - a*d)*
(f + g*x))/((d*f - c*g)*(a + b*x)))])/((b*f - a*g)*h) - (B^4*Log[(e*(a + b*
x)^n)/(c + d*x)^n]^4*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))
])/((b*f - a*g)*h) + (4*A^3*B*n*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*
f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*A^2*B^2*n*Log[(e*(a + b*x)^n)/(
c + d*x)^n]*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))]
)/((b*f - a*g)*h) + (12*A*B^3*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[
2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) +
(4*B^4*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*PolyLog[2, 1 + ((b*c - a*d)*(f
+ g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*A^2*B^2*n^2*PolyLog
[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) +
 (24*A*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[3, 1 + ((b*c - a*d)
*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*B^4*n^2*Log[(e*
(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f -
c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*A*B^3*n^3*PolyLog[4, 1 + ((b*c - a*
d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^4*n^3*Log[(
e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[4, 1 + ((b*c - a*d)*(f + g*x))/((d*f -
c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^4*n^4*PolyLog[5, 1 + ((b*c - a*d)
*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

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

Rule 31

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

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
```

```
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
 d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{(f+gx)(ah+bhx)}\,dx = \int \left(\frac{A^4}{h(a+bx)(f+gx)} + \frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})}{h(a+bx)(f+gx)} + \frac{6A^2B^2\log^2(e}{h(a+}\right.$$

$$= \frac{A^4\int \frac{1}{(a+bx)(f+gx)}\,dx}{h} + \frac{(4A^3B)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h} + \frac{(6A^2B^2)\int \frac{\log^2(e}{(a}}{h}$$

$$= -\frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{6A^2B^2\log^2(e(a+}{}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})\log(}{(bf-ag)h}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})\log(}{(bf-ag)h}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})\log(}{(bf-ag)h}$$

$$= \frac{A^4\log(a+bx)}{(bf-ag)h} - \frac{A^4\log(f+gx)}{(bf-ag)h} - \frac{4A^3B\log(e(a+bx)^n(c+dx)^{-n})\log(}{(bf-ag)h}$$

Mathematica [F] time = 4.20214, size = 0, normalized size = 0.

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^4}{(f+gx)(ah+bhx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/((f + g*x)*(a*h + b*h*
x)),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/((f + g*x)*(a*h + b*h*
x)), x]
```

Maple [F] time = 5.059, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)(bhx+ah)}\left(A+B\ln\left(\frac{e(bx+a)^n}{(dx+c)^n}\right)\right)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^4\left(\frac{\log(bx+a)}{(bf-ag)h}-\frac{\log(gx+f)}{(bf-ag)h}\right)+\int\frac{B^4\log\left((bx+a)^n\right)^4+B^4\log\left((dx+c)^n\right)^4+B^4\log(e)^4+4\,AB^3\log(e)^3+6\,A^2B^2\log\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x, algor
ithm="maxima")
```

```
[Out] A^4*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) + integra
te((B^4*log((b*x + a)^n)^4 + B^4*log((d*x + c)^n)^4 + B^4*log(e)^4 + 4*A*B^
3*log(e)^3 + 6*A^2*B^2*log(e)^2 + 4*A^3*B*log(e) + 4*(B^4*log(e) + A*B^3)*l
og((b*x + a)^n)^3 - 4*(B^4*log((b*x + a)^n) + B^4*log(e) + A*B^3)*log((d*x
+ c)^n)^3 + 6*(B^4*log(e)^2 + 2*A*B^3*log(e) + A^2*B^2)*log((b*x + a)^n)^2
+ 6*(B^4*log((b*x + a)^n)^2 + B^4*log(e)^2 + 2*A*B^3*log(e) + A^2*B^2 + 2*(
B^4*log(e) + A*B^3)*log((b*x + a)^n))*log((d*x + c)^n)^2 + 4*(B^4*log(e)^3
+ 3*A*B^3*log(e)^2 + 3*A^2*B^2*log(e) + A^3*B)*log((b*x + a)^n) - 4*(B^4*lo
g((b*x + a)^n)^3 + B^4*log(e)^3 + 3*A*B^3*log(e)^2 + 3*A^2*B^2*log(e) + A^3
*B + 3*(B^4*log(e) + A*B^3)*log((b*x + a)^n)^2 + 3*(B^4*log(e)^2 + 2*A*B^3*
log(e) + A^2*B^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h +
(b*f*h + a*g*h)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^4\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^4+4\,AB^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3+6\,A^2B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+4\,A^3B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^4}{bghx^2+afh+(bf+ag)hx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x, algor
ithm="fricas")
```

```
[Out] integral((B^4*log((b*x + a)^n*e/(d*x + c)^n)^4 + 4*A*B^3*log((b*x + a)^n*e/
(d*x + c)^n)^3 + 6*A^2*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 4*A^3*B*log((
b*x + a)^n*e/(d*x + c)^n) + A^4)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**4/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^4}{(bhx+ah)\left(gx+f\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^4/((b*h*x + a*h)*(g*x + f)
), x)
```

3.250 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=282

$$\frac{6B^2n^2\text{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{h(bf-ag)}+\frac{3Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)(B\log(e(a+bx)^n(c+$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (3*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])^2*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a +
 b*x))])/((b*f - a*g)*h) + (6*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*
g)*h) + (6*B^3*n^3*PolyLog[4, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x
))])/((b*f - a*g)*h)
```

Rubi [B] time = 1.21108, antiderivative size = 656, normalized size of antiderivative = 2.33, number of steps used = 15, number of rules used = 9, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.209, Rules used = {6742, 36, 31, 2503, 2502, 2315, 2506, 6610, 2508}

$$\frac{3A^2Bn\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{6AB^2n\log(e(a+bx)^n(c+dx)^{-n})\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{6AB^2n^2\text{PolyL}}{h}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] (A^3*Log[a + b*x])/((b*f - a*g)*h) - (A^3*Log[f + g*x])/((b*f - a*g)*h) - (
3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*
f - c*g)*(a + b*x)))])/((b*f - a*g)*h) - (3*A*B^2*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])/((b*f -
a*g)*h) - (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*Log[-(((b*c - a*d)*(f + g
*x))/((d*f - c*g)*(a + b*x)))])/((b*f - a*g)*h) + (3*A^2*B*n*PolyLog[2, 1 +
 ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*A*B
^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x)
)/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (3*B^3*n*Log[(e*(a + b*x)^n)/
(c + d*x)^n]^2*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x
))])/((b*f - a*g)*h) + (6*A*B^2*n^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/
((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*B^3*n^2*Log[(e*(a + b*x)^n)/
(c + d*x)^n]*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))
])/((b*f - a*g)*h) + (6*B^3*n^3*PolyLog[4, 1 + ((b*c - a*d)*(f + g*x))/((d*
f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

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

Rule 31

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

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
 d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(f+gx)(ah+bhx)}\,dx = \int \left(\frac{A^3}{h(a+bx)(f+gx)} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{h(a+bx)(f+gx)} + \frac{3AB^2\log^2(e(a+\ldots}{h(a+bx\ldots}\right.$$

$$= \frac{A^3\int\frac{1}{(a+bx)(f+gx)}dx}{h} + \frac{(3A^2B)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}dx}{h} + \frac{(3AB^2)\int\frac{\log^2(e(a+bx\ldots}{(a+bx)\ldots}}{h}$$

$$= -\frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{3AB^2\log^2(e(a+bx)\ldots}{\ldots}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(b\ldots}{(d\ldots}\right.}{(bf-ag)h}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(b\ldots}{(d\ldots}\right.}{(bf-ag)h}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(b\ldots}{(d\ldots}\right.}{(bf-ag)h}$$

Mathematica [F] time = 3.09403, size = 0, normalized size = 0.

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(f+gx)(ah+bhx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((f + g*x)*(a*h + b*h*
x)),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((f + g*x)*(a*h + b*h*
x)), x]
```

Maple [F] time = 3.089, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)(bhx+ah)}\left(A+B\ln\left(\frac{e(bx+a)^n}{(dx+c)^n}\right)\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^3\left(\frac{\log(bx+a)}{(bf-ag)h} - \frac{\log(gx+f)}{(bf-ag)h}\right) - \int -\frac{B^3\log\left((bx+a)^n\right)^3 - B^3\log\left((dx+c)^n\right)^3 + B^3\log(e)^3 + 3AB^2\log(e)^2 + 3A^2B\log\ldots}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x, algor
ithm="maxima")
```

```
[Out] A^3*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - integra
te(-(B^3*log((b*x + a)^n)^3 - B^3*log((d*x + c)^n)^3 + B^3*log(e)^3 + 3*A*B
^2*log(e)^2 + 3*A^2*B*log(e) + 3*(B^3*log(e) + A*B^2)*log((b*x + a)^n)^2 +
3*(B^3*log((b*x + a)^n) + B^3*log(e) + A*B^2)*log((d*x + c)^n)^2 + 3*(B^3*l
og(e)^2 + 2*A*B^2*log(e) + A^2*B)*log((b*x + a)^n) - 3*(B^3*log((b*x + a)^n
)^2 + B^3*log(e)^2 + 2*A*B^2*log(e) + A^2*B + 2*(B^3*log(e) + A*B^2)*log((b
*x + a)^n))*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{bghx^2 + afh + \left(bf + ag\right)hx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x, algor
ithm="fricas")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(b*g*h*x^2 +
 a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{(bhx + ah)\left(gx + f\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(g*x+f)/(b*h*x+a*h),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/((b*h*x + a*h)*(g*x + f)
), x)
```

3.251 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=203

$$\frac{2Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{h(bf-ag)}+\frac{2B^2n^2\text{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-a}{(a+bx)(df-c}\right.}{}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (2*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b
*x))])/((b*f - a*g)*h) + (2*B^2*n^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*
f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rubi [A] time = 0.76188, antiderivative size = 371, normalized size of antiderivative = 1.83, number of steps used = 11, number of rules used = 8, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.186, Rules used = {6742, 36, 31, 2503, 2502, 2315, 2506, 6610}

$$\frac{2ABn\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{2B^2n\log(e(a+bx)^n(c+dx)^{-n})\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{2B^2n^2\text{PolyLog}\left(\right.}{h(bf}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] (A^2*Log[a + b*x])/((b*f - a*g)*h) - (A^2*Log[f + g*x])/((b*f - a*g)*h) - (
2*A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*f
- c*g)*(a + b*x)))])/((b*f - a*g)*h) - (B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n
]^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])/((b*f - a*g)*h
) + (2*A*B*n*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))
])/((b*f - a*g)*h) + (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1
 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (2*B
^2*n^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b
*f - a*g)*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

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

Rule 31

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

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
```

```
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(f+gx)(ah+bhx)}\,dx = \int\left(\frac{A^2}{h(a+bx)(f+gx)}+\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{h(a+bx)(f+gx)}+\frac{B^2\log^2(e(a+}{h(a+bx}\right.$$

$$=\frac{A^2\int\frac{1}{(a+bx)(f+gx)}\,dx}{h}+\frac{(2AB)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h}+\frac{B^2\int\frac{\log^2(e(a+bx)^n(c}{(a+bx)(f+g}}{h}$$

$$=-\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}-\frac{B^2\log^2(e(a+bx)^n}{}$$

$$=\frac{A^2\log(a+bx)}{(bf-ag)h}-\frac{A^2\log(f+gx)}{(bf-ag)h}-\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\right.}{(bf-ag)h}$$

$$=\frac{A^2\log(a+bx)}{(bf-ag)h}-\frac{A^2\log(f+gx)}{(bf-ag)h}-\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\right.}{(bf-ag)h}$$

Mathematica [B] time = 1.04567, size = 1415, normalized size = 6.97

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/((f + g*x)*(a*h + b*h*
x)),x]
```

```
[Out] (3*Log[a + b*x]*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*
x)^n)/(c + d*x)^n]))^2 - 3*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log
[(e*(a + b*x)^n)/(c + d*x)^n]))^2*Log[f + g*x] + 3*B*n*(A + B*(-(n*Log[a +
b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n]))*(Log[a + b*x]^2
 - 2*(Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)] + PolyLog[2, (g*(a + b*x)
)/(-(b*f) + a*g)])) - 6*A*B*n*(Log[c + d*x]*(Log[(d*(a + b*x))/(-(b*c) + a*
d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*(c + d*x))/(b*c - a*d
)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + 6*B^2*n*(n*Log[a + b*x] -
n*Log[c + d*x] - Log[(e*(a + b*x)^n)/(c + d*x)^n])*(Log[c + d*x]*(Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*
(c + d*x))/(b*c - a*d)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + B^2*n
^2*(Log[a + b*x]^2*(Log[a + b*x] - 3*Log[(b*(f + g*x))/(b*f - a*g)]) - 6*Lo
g[a + b*x]*PolyLog[2, (g*(a + b*x))/(-(b*f) + a*g)] + 6*PolyLog[3, (g*(a +
b*x))/(-(b*f) + a*g)]) + 3*B^2*n^2*(Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c
 + d*x]^2 - Log[c + d*x]^2*Log[(d*(f + g*x))/(d*f - c*g)] + 2*Log[c + d*x]*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*Log[c + d*x]*PolyLog[2, (g*(c + d
*x))/(-(d*f) + c*g)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[
3, (g*(c + d*x))/(-(d*f) + c*g)]) - 6*B^2*n^2*((Log[a + b*x]^2*(Log[c + d*x
] - Log[(b*(c + d*x))/(b*c - a*d)]))/2 - Log[a + b*x]*Log[c + d*x]*Log[(b*(
f + g*x))/(b*f - a*g)] - (Log[(g*(c + d*x))/(-(d*f) + c*g)]*(-2*Log[a + b*x
] + Log[(g*(c + d*x))/(-(d*f) + c*g)])*(Log[(b*(f + g*x))/(b*f - a*g)] - Lo
g[(d*(f + g*x))/(d*f - c*g)]))/2 + Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((
b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(Log[(b*(f + g*x))/(b*f - a*
g)] - Log[(d*(f + g*x))/(d*f - c*g)]) - (Log[((b*f - a*g)*(c + d*x))/((d*f
- c*g)*(a + b*x))]^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))] + Log[(b*(f + g*x))
/(b*f - a*g)] - Log[((-(b*c) + a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))]))/2
 - Log[a + b*x]*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - (Log[c + d*x] -
Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(a + b*
x))/(-(b*f) + a*g)] - (Log[a + b*x] + Log[((b*f - a*g)*(c + d*x))/((d*f - c
*g)*(a + b*x))])*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)] - Log[((b*f - a*g
)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(PolyLog[2, (b*(c + d*x))/(d*(a + b*x
))] - PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]) + PolyLo
g[3, (d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[3, (g*(a + b*x))/(-(b*f) + a*g
)] + PolyLog[3, (g*(c + d*x))/(-(d*f) + c*g)] + PolyLog[3, (b*(c + d*x))/(d
*(a + b*x))] - PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])
)/(3*(b*f - a*g)*h)
```

Maple [F] time = 3.411, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)(bhx+ah)}\left(A+B\ln\left(\frac{e(bx+a)^n}{(dx+c)^n}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^2\left(\frac{\log(bx+a)}{(bf-ag)h}-\frac{\log(gx+f)}{(bf-ag)h}\right)+\int\frac{B^2\log\left((bx+a)^n\right)^2+B^2\log\left((dx+c)^n\right)^2+B^2\log(e)^2+2\,AB\log(e)+2\left(B^2\log\right.}{bghx^2+af}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x, algor
ithm="maxima")
```

```
[Out] A^2*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) + integra
te((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^n)^2 + B^2*log(e)^2 + 2*A*B*
log(e) + 2*(B^2*log(e) + A*B)*log((b*x + a)^n) - 2*(B^2*log((b*x + a)^n) +
B^2*log(e) + A*B)*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x)
, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2}{bghx^2+afh+(bf+ag)hx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x, algor
ithm="fricas")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{(bhx+ah)(gx+f)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(g*x+f)/(b*h*x+a*h),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/((b*h*x + a*h)*(g*x + f)
), x)
```

3.252 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(f+gx)(ah+bhx)}\,dx$

Optimal. Leaf size=123

$$\frac{Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)}{h(bf-ag)}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - ((b*f - a*g)*(c + d*x))
/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (B*n*PolyLog[2, ((b*f - a*g)*
(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rubi [A] time = 0.365071, antiderivative size = 163, normalized size of antiderivative = 1.33, number of steps used = 8, number of rules used = 6, integrand size = 41, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.146, Rules used = {6742, 36, 31, 2503, 2502, 2315}

$$\frac{Bn\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{A\log(a+bx)}{h(bf-ag)}-\frac{A\log(f+gx)}{h(bf-ag)}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((f + g*x)*(a*h + b*h*x)),x]
```

```
[Out] (A*Log[a + b*x])/((b*f - a*g)*h) - (A*Log[f + g*x])/((b*f - a*g)*h) - (B*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(
a + b*x)))])/((b*f - a*g)*h) + (B*n*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/
((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

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

Rule 31

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

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
```

```
x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(f+gx)(ah+bhx)}\,dx = \int \left(\frac{A}{h(a+bx)(f+gx)}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h(a+bx)(f+gx)}\right)dx$$

$$= \frac{A\int \frac{1}{(a+bx)(f+gx)}\,dx}{h}+\frac{B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\,dx}{h}$$

$$= -\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{(Ab)\int \frac{1}{a+bx}\,dx}{(bf-ag)h}-\frac{(Ag)\int \frac{}{f+}}{(bf-a}$$

$$= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx}{(df-cg)(a+bx}\right.}{(bf-ag)h}$$

$$= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx}{(df-cg)(a+bx}\right.}{(bf-ag)h}$$

Mathematica [B] time = 0.291616, size = 304, normalized size = 2.47

$$-\frac{2Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+2Bn\text{PolyLog}\left(2,\frac{g(a+bx)}{ag-bf}\right)-2Bn\text{PolyLog}\left(2,\frac{g(c+dx)}{cg-df}\right)-2A\log(a+bx)+2B\log(f+gx)\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((f + g*x)*(a*h + b*h*x)
),x]
```

```
[Out] -(-2*A*Log[a + b*x] + B*n*Log[a + b*x]^2 - 2*B*n*Log[a + b*x]*Log[c + d*x]
+ 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] - 2*B*Log[a + b*x]*L
og[(e*(a + b*x)^n)/(c + d*x)^n] + 2*A*Log[f + g*x] - 2*B*n*Log[a + b*x]*Log
[f + g*x] + 2*B*n*Log[c + d*x]*Log[f + g*x] + 2*B*Log[(e*(a + b*x)^n)/(c +
d*x)^n]*Log[f + g*x] + 2*B*n*Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)] -
2*B*n*Log[c + d*x]*Log[(d*(f + g*x))/(d*f - c*g)] + 2*B*n*PolyLog[2, (g*(a
+ b*x))/(-(b*f) + a*g)] + 2*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*B
*n*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)])/(2*(b*f - a*g)*h)
```

Maple [C] time = 0.73, size = 1447, normalized size = 11.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] -1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I/h/(
a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I/h/(a*g-b*f)
*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+B/h*n/(a*g-b*f)*dilog((d*(g
*x+f)+c*g-d*f)/(c*g-d*f))-B/h*n/(a*g-b*f)*dilog((-a*d+b*c+d*(b*x+a))/(-a*d+
b*c))+1/h/(a*g-b*f)*ln(g*x+f)*B*ln(e)-1/h/(a*g-b*f)*ln(b*x+a)*B*ln(e)+1/2*I
/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b
*x+a)^n/((d*x+c)^n))+1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/h*B/(a*g-b*f)*ln(g*x+f
)*ln((b*x+a)^n)-1/h*B*n/(a*g-b*f)*ln(g*x+f)*ln((b*(g*x+f)+a*g-b*f)/(a*g-b*f
))+B/h*n/(a*g-b*f)*ln(g*x+f)*ln((d*(g*x+f)+c*g-d*f)/(c*g-d*f))-B/h*n/(a*g-b
*f)*ln(b*x+a)*ln((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))-1/2*I/h/(a*g-b*f)*ln(g*x+
f)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)-1/h*B*ln((b*x+a)^n)/(a*g-b*f)*ln(b*x+a)-B/h*ln((d*x+c)^n)/(a*g-b*f)*ln
(g*x+f)+B/h*ln((d*x+c)^n)/(a*g-b*f)*ln(b*x+a)-1/2*I/h/(a*g-b*f)*ln(g*x+f)*B
*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/h
*A/(a*g-b*f)*ln(b*x+a)+1/h*A/(a*g-b*f)*ln(g*x+f)-1/h*B*n/(a*g-b*f)*dilog((b
*(g*x+f)+a*g-b*f)/(a*g-b*f))+1/2/h*B*n/(a*g-b*f)*ln(b*x+a)^2-1/2*I/h/(a*g-b
*f)*ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g
-b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^2-1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn
(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I/((d*x+c
)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn
(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g-b*
f)*ln(g*x+f)*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-
b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I
/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A\left(\frac{\log\left(bx+a\right)}{\left(bf-ag\right)h}-\frac{\log\left(gx+f\right)}{\left(bf-ag\right)h}\right)-B\int-\frac{\log\left(\left(bx+a\right)^{n}\right)-\log\left(\left(dx+c\right)^{n}\right)+\log\left(e\right)}{bghx^{2}+afh+\left(bfh+agh\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorit
hm="maxima")
```

```
[Out] A*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - B*integra
te(-(log((b*x + a)^n) - log((d*x + c)^n) + log(e))/(b*g*h*x^2 + a*f*h + (b*
f*h + a*g*h)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A}{bghx^{2}+afh+\left(bf+ag\right)hx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorit
hm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f +
 a*g)*h*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(g*x+f)/(b*h*x+a*h),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A}{(bhx + ah)\left(gx + f\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/((b*h*x + a*h)*(g*x + f)),
 x)
```

3.253 $\int \frac{1}{(f+gx)(ah+bhx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}dx$

Optimal. Leaf size=81

$$\text{Subst}\left(\text{Unintegrable}\left(\frac{1}{(f+gx)(ah+bhx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)$$

```
[Out] Defer[Subst][Unintegrable[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*x)
^n]
```

Rubi [A] time = 0.426943, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] (b*Defer[Int][1/((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x])/(
(b*f - a*g)*h) - (g*Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n])), x])/((b*f - a*g)*h)
```

Rubi steps

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}dx = \int \left(\frac{b}{(bf-ag)h(a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-r}\right.\right.}\right.$$
$$= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}dx}{(bf-ag)h} - \frac{g\int \frac{}{(f+gx)(A+B\log(}}{(bf-}$$

Mathematica [A] time = 0.16094, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])),x]
```

```
[Out] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])), x]
```

Maple [A] time = 7.096, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)\left(bhx+ah\right)}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bhx+ah)\left(gx+f\right)\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algor
ithm="maxima")
```

```
[Out] integrate(1/((b*h*x + a*h)*(g*x + f)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)
), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Abghx^{2}+Aafh+\left(Abf+Aag\right)hx+\left(Bbghx^{2}+Bafh+\left(Bbf+Bag\right)hx\right)\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algor
ithm="fricas")
```

```
[Out] integral(1/(A*b*g*h*x^2 + A*a*f*h + (A*b*f + A*a*g)*h*x + (B*b*g*h*x^2 + B*
a*f*h + (B*b*f + B*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bhx+ah)(gx+f)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algor
ithm="giac")
```

```
[Out] integrate(1/((b*h*x + a*h)*(g*x + f)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)
), x)
```

3.254 $\int \frac{1}{(f+gx)(ah+bhx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx$

Optimal. Leaf size=81

$$\text{Subst}\left(\text{Unintegrable}\left(\frac{1}{(f+gx)(ah+bhx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)$$

```
[Out] Defer[Subst][Unintegrable[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*
x)^n]
```

Rubi [A] time = 0.479691, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2),
x]
```

```
[Out] (b*Defer[Int][1/((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2), x])
/((b*f - a*g)*h) - (g*Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])^2), x])/((b*f - a*g)*h)
```

Rubi steps

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx = \int \left(\frac{b}{(bf-ag)h(a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\right.$$
$$= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx}{(bf-ag)h} - \frac{g\int \frac{1}{(f+gx)(A+B\log(e(}}{(bf-}$$

Mathematica [A] time = 0.331617, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)(ah+bhx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])^2),x]
```

```
[Out] Integrate[1/((f + g*x)*(a*h + b*h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])^2), x]
```

Maple [A] time = 9.293, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)(bhx+ah)}\left(A+B\ln\left(\frac{e(bx+a)^{n}}{(dx+c)^{n}}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] int(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$(df-cg)\int \frac{}{(bcf^2hn-adf^2hn)AB+(bcf^2hn\log(e)-adf^2hn\log(e))B^2+((bcg^2hn-adg^2hn)AB+(bcg^2hn\log(e)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, alg
orithm="maxima")
```

```
[Out] (d*f - c*g)*integrate(1/((b*c*f^2*h*n - a*d*f^2*h*n)*A*B + (b*c*f^2*h*n*log
(e) - a*d*f^2*h*n*log(e))*B^2 + ((b*c*g^2*h*n - a*d*g^2*h*n)*A*B + (b*c*g^2
*h*n*log(e) - a*d*g^2*h*n*log(e))*B^2)*x^2 + 2*((b*c*f*g*h*n - a*d*f*g*h*n)
*A*B + (b*c*f*g*h*n*log(e) - a*d*f*g*h*n*log(e))*B^2)*x + ((b*c*g^2*h*n - a
*d*g^2*h*n)*B^2*x^2 + 2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*c*f^2*h*n -
a*d*f^2*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g^2*h*n - a*d*g^2*h*n)*B^2*x^2 +
 2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*c*f^2*h*n - a*d*f^2*h*n)*B^2)*log
((d*x + c)^n)), x) - (d*x + c)/((b*c*f*h*n - a*d*f*h*n)*A*B + (b*c*f*h*n*lo
g(e) - a*d*f*h*n*log(e))*B^2 + ((b*c*g*h*n - a*d*g*h*n)*A*B + (b*c*g*h*n*lo
g(e) - a*d*g*h*n*log(e))*B^2)*x + ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b*c*f*h
*n - a*d*f*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b
*c*f*h*n - a*d*f*h*n)*B^2)*log((d*x + c)^n))
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2bghx^2+A^2afh+(A^2bf+A^2ag)hx+(B^2bghx^2+B^2afh+(B^2bf+B^2ag)hx)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+2\,(ABbg}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, alg
orithm="fricas")
```

```
[Out] integral(1/(A^2*b*g*h*x^2 + A^2*a*f*h + (A^2*b*f + A^2*a*g)*h*x + (B^2*b*g*
h*x^2 + B^2*a*f*h + (B^2*b*f + B^2*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*b*g*h*x^2 + A*B*a*f*h + (A*B*b*f + A*B*a*g)*h*x)*log((b*x + a)^
n*e/(d*x + c)^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bhx+ah)(gx+f)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, alg
orithm="giac")
```

```
[Out] integrate(1/((b*h*x + a*h)*(g*x + f)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)
^2), x)
```

3.255 $\int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((a-c)h+(b-d)hx)}\,dx$

Optimal. Leaf size=33

$$-\frac{\text{PolyLog}\left(2,1-\frac{c+dx}{a+bx}\right)}{h(bc-ad)}$$

```
[Out] -(PolyLog[2, 1 - (c + d*x)/(a + b*x)]/((b*c - a*d)*h))
```

Rubi [A] time = 0.0950319, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.05, Rules used = {2502, 2315}

$$-\frac{\text{PolyLog}\left(2,1-\frac{c+dx}{a+bx}\right)}{h(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(c + d*x)/(a + b*x)]/((a + b*x)*((a - c)*h + (b - d)*h*x)),x]
```

```
[Out] -(PolyLog[2, 1 - (c + d*x)/(a + b*x)]/((b*c - a*d)*h))
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((a-c)h+(b-d)hx)}\,dx &= -\frac{\text{Subst}\left(\int \frac{\log(x)}{1-x}\,dx, x, \frac{c+dx}{a+bx}\right)}{(bc-ad)h}\\ &= -\frac{\text{Li}_2\left(1-\frac{c+dx}{a+bx}\right)}{(bc-ad)h}\end{aligned}$$

Mathematica [B] time = 0.173132, size = 298, normalized size = 9.03

$$\frac{2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2\text{PolyLog}\left(2,-\frac{b(a+bx-c-dx)}{bc-ad}\right)-2\text{PolyLog}\left(2,-\frac{d(-a-bx+c+dx)}{ad-bc}\right)-\log^2\left(\frac{ad-bc}{d(a+bx)}\right)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(c + d*x)/(a + b*x)]/((a + b*x)*((a - c)*h + (b - d)*h*x)),x]
```

```
[Out] (-Log[(-(b*c) + a*d)/(d*(a + b*x))]^2 + 2*Log[((b - d)*(a + b*x))/(b*c - a*
d)]*Log[a - c + b*x - d*x] - 2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(b*(c
+ d*x))/(b*c - a*d)] - 2*Log[a - c + b*x - d*x]*Log[((b - d)*(c + d*x))/(b*
c - a*d)] + 2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(c + d*x)/(a + b*x)] +
2*Log[a - c + b*x - d*x]*Log[(c + d*x)/(a + b*x)] + 2*PolyLog[2, (d*(a + b*
x))/(-(b*c) + a*d)] + 2*PolyLog[2, -((b*(a - c + b*x - d*x))/(b*c - a*d))]
- 2*PolyLog[2, -((d*(-a + c - b*x + d*x))/(-(b*c) + a*d))])/((2*b*c - 2*a*d
)*h)
```

Maple [A] time = 0.065, size = 42, normalized size = 1.3

$$\frac{1}{h\left(ad-bc\right)}\mathrm{dilog}\left(-\frac{ad-bc}{b\left(bx+a\right)}+\frac{d}{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x)
```

```
[Out] 1/h/(a*d-b*c)*dilog(-1/b*(a*d-b*c)/(b*x+a)+d/b)
```

Maxima [B] time = 1.27618, size = 482, normalized size = 14.61

$$\left(\frac{\log\left(-(b-d)x-a+c\right)}{(bc-ad)h}-\frac{\log\left(bx+a\right)}{(bc-ad)h}\right)\log\left(\frac{dx+c}{bx+a}\right)+\frac{2\,\log\left(-(b-d)x-a+c\right)\log\left(bx+a\right)-\log\left(bx+a\right)^2}{2\left(bch-adh\right)}+\frac{\log\left(bx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x, algorithm="ma
xima")
```

```
[Out] (log(-(b - d)*x - a + c)/((b*c - a*d)*h) - log(b*x + a)/((b*c - a*d)*h))*lo
g((d*x + c)/(b*x + a)) + 1/2*(2*log(-(b - d)*x - a + c)*log(b*x + a) - log(
b*x + a)^2)/(b*c*h - a*d*h) + (log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) +
 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*c*h - a*d*h) - (log(b*x + a)*lo
g(-(a*(b - d) + (b^2 - b*d)*x)/(b*c - a*d) + 1) + dilog((a*(b - d) + (b^2 -
 b*d)*x)/(b*c - a*d)))/(b*c*h - a*d*h) - (log(-(b - d)*x - a + c)*log((a*d
- c*d + (b*d - d^2)*x)/(b*c - a*d) + 1) + dilog(-(a*d - c*d + (b*d - d^2)*x
)/(b*c - a*d)))/(b*c*h - a*d*h)
```

Fricas [A] time = 0.461014, size = 68, normalized size = 2.06

$$-\frac{\mathrm{Li}_2\left(-\frac{dx+c}{bx+a}+1\right)}{(bc-ad)h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x, algorithm="fr
icas")
```

```
[Out] -dilog(-(d*x + c)/(b*x + a) + 1)/((b*c - a*d)*h)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(\frac{dx+c}{bx+a}\right)}{((b-d)hx+(a-c)h)(bx+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((d*x+c)/(b*x+a))/(b*x+a)/((a-c)*h+(b-d)*h*x),x, algorithm="gi
ac")
```

```
[Out] integrate(log((d*x + c)/(b*x + a))/(((b - d)*h*x + (a - c)*h)*(b*x + a)), x
)
```

3.256 $\int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=27

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

```
[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rubi [A] time = 0.0656417, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2502, 2315}

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(a - c*g + (b - d*g)*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)}\,dx &= -\frac{g\,\text{Subst}\left(\int \frac{\log(x)}{1-x}\,dx,x,\frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg)-a(b-dg)}\\ &= \frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}\end{aligned}$$

Mathematica [B] time = 0.241122, size = 320, normalized size = 11.85

$$\frac{-2\text{PolyLog}\left(2,\frac{(a+bx)(b-dg)}{g(bc-ad)}\right)+2\text{PolyLog}\left(2,\frac{(b-dg)(c+dx)}{bc-ad}\right)-2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log^2\left(\frac{g(bc-ad)}{(a+bx)(b-dg)}\right)+2\log\left(-\frac{b(a+bx-cg-}{g(bc-ad}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(a - c*g + (b - d*g)*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] (Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]^2 - 2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)]*Log[c + d*x] + 2*Log[c + d*x]*Log[-((d*(a - c*g + b*x - d*g*x))/(b
*c - a*d))] + 2*Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]*Log[-((b*(a - c*
g + b*x - d*g*x))/((b*c - a*d)*g))] - 2*Log[((b*c - a*d)*g)/((b - d*g)*(a +
 b*x))]*Log[(a - c*g + b*x - d*g*x)/(a + b*x)] - 2*Log[c + d*x]*Log[(a - c*
g + b*x - d*g*x)/(a + b*x)] - 2*PolyLog[2, ((b - d*g)*(a + b*x))/((b*c - a*
d)*g)] - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[2, ((b - d*g)*
(c + d*x))/(b*c - a*d)])/(2*b*c - 2*a*d)
```

Maple [A] time = 0.065, size = 45, normalized size = 1.7

$$-\frac{1}{ad-bc}\operatorname{dilog}\left(\frac{-dg+b}{b}+\frac{g\,(ad-bc)}{b\,(bx+a)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] -1/(a*d-b*c)*dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))
```

Maxima [B] time = 1.41181, size = 464, normalized size = 17.19

$$\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(-\frac{cg+\left(dg-b\right)x-a}{bx+a}\right)+\frac{\log(bx+a)^2-2\,\log(bx+a)\log(dx+c)}{2\,(bc-ad)}-\frac{\log(bx+a)\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="max
ima")
```

```
[Out] (log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(c*g + (d*g - b)
*x - a)/(b*x + a)) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*
c - a*d) - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g
) + 1) + dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*
d) + (log(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + d
ilog(-(c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)/(b*c - a*d)
```

Fricas [A] time = 0.476334, size = 78, normalized size = 2.89

$$\frac{\operatorname{Li}_2\left(\frac{cg+\left(dg-b\right)x-a}{bx+a}+1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fri
cas")
```

```
[Out] dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(-\frac{cg+(dg-b)x-a}{bx+a}\right)}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="gia
c")
```

```
[Out] integrate(log(-(c*g + (d*g - b)*x - a)/(b*x + a))/((b*x + a)*(d*x + c)), x)
```

3.257 $\int \frac{\log\left(1-\frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)} dx$

Optimal. Leaf size=27

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

```
[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rubi [A] time = 0.117526, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2517, 2502, 2315}

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[Log[1 - (g*(c + d*x))/(a + b*x)]/((a + b*x)*(c + d*x)),x]

[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rule 2517

```
Int[Log[(e_.)*((f_.)*((g_) + (v_.)/(w_)))^(r_.)]^(s_.)*(u_.), x_Symbol] :>
Int[u*Log[e*((f*ExpandToSum[v + g*w, x])/ExpandToSum[w, x])^r]^s, x] /; Fre
eQ[{e, f, g, r, s}, x] && LinearQ[w, x] && (FreeQ[v, x] || LinearQ[v, x]) &
& AlgebraicFunctionQ[u, x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\log\left(1-\frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)} dx &= \int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)} dx \\
&= -\frac{g\,\text{Subst}\left(\int \frac{\log(x)}{1-x} dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg)-a(b-dg)} \\
&= \frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}
\end{aligned}$$

Mathematica [B] time = 0.17915, size = 320, normalized size = 11.85

$$\frac{-2\text{PolyLog}\left(2,\frac{(a+bx)(b-dg)}{g(bc-ad)}\right)+2\text{PolyLog}\left(2,\frac{(b-dg)(c+dx)}{bc-ad}\right)-2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log^2\left(\frac{g(bc-ad)}{(a+bx)(b-dg)}\right)+2\log\left(-\frac{b(a+bx-cg-}{g(bc-ad}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[1 - (g*(c + d*x))/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] (Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]^2 - 2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)]*Log[c + d*x] + 2*Log[c + d*x]*Log[-((d*(a - c*g + b*x - d*g*x))/(b
*c - a*d))] + 2*Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]*Log[-((b*(a - c*
g + b*x - d*g*x))/((b*c - a*d)*g))] - 2*Log[((b*c - a*d)*g)/((b - d*g)*(a +
 b*x))]*Log[(a - c*g + b*x - d*g*x)/(a + b*x)] - 2*Log[c + d*x]*Log[(a - c*
g + b*x - d*g*x)/(a + b*x)] - 2*PolyLog[2, ((b - d*g)*(a + b*x))/((b*c - a*
d)*g)] - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[2, ((b - d*g)*
(c + d*x))/(b*c - a*d)])/(2*b*c - 2*a*d)
```

Maple [A] time = 0.063, size = 45, normalized size = 1.7

$$-\frac{1}{ad-bc}\text{dilog}\left(\frac{-dg+b}{b}+\frac{g\,(ad-bc)}{b\,(bx+a)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] -1/(a*d-b*c)*dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))
```

Maxima [B] time = 1.31414, size = 454, normalized size = 16.81

$$\left(\frac{\log{(bx+a)}}{bc-ad}-\frac{\log{(dx+c)}}{bc-ad}\right)\log\left(-\frac{(dx+c)g}{bx+a}+1\right)+\frac{\log{(bx+a)}^2-2\,\log{(bx+a)}\log{(dx+c)}}{2\,(bc-ad)}-\frac{\log{(bx+a)}\log\left(\frac{(dg-b)}{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="maxima")
```

```
[Out] (log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(d*x + c)*g/(b*x
 + a) + 1) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*c - a*d)
 - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g) + 1) +
 dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*d) + (lo
g(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + dilog(-(c
*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x + a)*log
((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*c -
 a*d)
```

Fricas [A] time = 0.497173, size = 78, normalized size = 2.89

$$\frac{\text{Li}_2\left(\frac{cg+(dg-b)x-a}{bx+a}+1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fricas")
```

```
[Out] dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(-\frac{(dx+c)g}{bx+a}+1\right)}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(log(-(d*x + c)*g/(b*x + a) + 1)/((b*x + a)*(d*x + c)), x)
```

3.258 $\int \frac{\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=27

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

```
[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rubi [A] time = 0.116849, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.079, Rules used = {2516, 2502, 2315}

$$\frac{\text{PolyLog}\left(2,\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(a - c*g + b*x - d*g*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] PolyLog[2, (g*(c + d*x))/(a + b*x)]/(b*c - a*d)
```

Rule 2516

```
Int[Log[(e_.)*((f_.)*(v_)^(p_.)*(w_)^(q_.))^(r_.)]^(s_.)*(u_.), x_Symbol] :
> Int[u*Log[e*(f*ExpandToSum[v, x]^p*ExpandToSum[w, x]^q)^r]^s, x] /; FreeQ
[{e, f, p, q, r, s}, x] && LinearQ[{v, w}, x] &&  !LinearMatchQ[{v, w}, x]
&& AlgebraicFunctionQ[u, x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)}\,dx &= \int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)}\,dx \\
&= -\frac{g\,\text{Subst}\left(\int \frac{\log(x)}{1-x}\,dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg)-a(b-dg)} \\
&= \frac{\text{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}
\end{aligned}$$

Mathematica [B] time = 0.161762, size = 320, normalized size = 11.85

$$-2\text{PolyLog}\left(2,\frac{(a+bx)(b-dg)}{g(bc-ad)}\right)+2\text{PolyLog}\left(2,\frac{(b-dg)(c+dx)}{bc-ad}\right)-2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log^2\left(\frac{g(bc-ad)}{(a+bx)(b-dg)}\right)+2\log\left(-\frac{b(a+bx}{g(b}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(a - c*g + b*x - d*g*x)/(a + b*x)]/((a + b*x)*(c + d*x)),x]
```

```
[Out] (Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]^2 - 2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)]*Log[c + d*x] + 2*Log[c + d*x]*Log[-((d*(a - c*g + b*x - d*g*x))/(b
*c - a*d))] + 2*Log[((b*c - a*d)*g)/((b - d*g)*(a + b*x))]*Log[-((b*(a - c*
g + b*x - d*g*x))/((b*c - a*d)*g))] - 2*Log[((b*c - a*d)*g)/((b - d*g)*(a +
 b*x))]*Log[(a - c*g + b*x - d*g*x)/(a + b*x)] - 2*Log[c + d*x]*Log[(a - c*
g + b*x - d*g*x)/(a + b*x)] - 2*PolyLog[2, ((b - d*g)*(a + b*x))/((b*c - a*
d)*g)] - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[2, ((b - d*g)*
(c + d*x))/(b*c - a*d)])/(2*b*c - 2*a*d)
```

Maple [A] time = 0.059, size = 45, normalized size = 1.7

$$-\frac{1}{ad-bc}\text{dilog}\left(\frac{-dg+b}{b}+\frac{g(ad-bc)}{b(bx+a)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] -1/(a*d-b*c)*dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))
```

Maxima [B] time = 1.16915, size = 463, normalized size = 17.15

$$\left(\frac{\log(bx+a)}{bc-ad}-\frac{\log(dx+c)}{bc-ad}\right)\log\left(-\frac{dgx+cg-bx-a}{bx+a}\right)+\frac{\log(bx+a)^2-2\log(bx+a)\log(dx+c)}{2(bc-ad)}-\frac{\log(bx+a)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="max
ima")
```

```
[Out] (log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(d*g*x + c*g - b
*x - a)/(b*x + a)) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*
c - a*d) - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g
) + 1) + dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*
d) + (log(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + d
ilog(-(c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)/(b*c - a*d)
```

Fricas [A] time = 0.502986, size = 78, normalized size = 2.89

$$\frac{\text{Li}_2\left(\frac{cg+(dg-b)x-a}{bx+a}+1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fri
cas")
```

```
[Out] dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(-\frac{dgx+cg-bx-a}{bx+a}\right)}{(bx+a)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="gia
c")
```

```
[Out] integrate(log(-(d*g*x + c*g - b*x - a)/(b*x + a))/((b*x + a)*(d*x + c)), x)
```

3.259 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{afh+bghx^2+h(bfx+agx)}\,dx$

Optimal. Leaf size=282

$$\frac{6B^2n^2\text{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{h(bf-ag)}+\frac{3Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)(B\log(e(a+bx)^n$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (3*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])^2*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a +
 b*x))])/((b*f - a*g)*h) + (6*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*
g)*h) + (6*B^3*n^3*PolyLog[4, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x
))])/((b*f - a*g)*h)
```

Rubi [B] time = 1.31199, antiderivative size = 656, normalized size of antiderivative = 2.33, number of steps used = 17, number of rules used = 11, integrand size = 51, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.216, Rules used = {6688, 12, 6742, 36, 31, 2503, 2502, 2315, 2506, 6610, 2508}

$$\frac{3A^2Bn\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{6AB^2n\log(e(a+bx)^n(c+dx)^{-n})\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{6AB^2n^2\text{Po}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a*f*h + b*g*h*x^2 + h*(b*f*
x + a*g*x)),x]
```

```
[Out] (A^3*Log[a + b*x])/((b*f - a*g)*h) - (A^3*Log[f + g*x])/((b*f - a*g)*h) - (
3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*
f - c*g)*(a + b*x)))])/((b*f - a*g)*h) - (3*A*B^2*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])/((b*f -
a*g)*h) - (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*Log[-(((b*c - a*d)*(f + g
*x))/((d*f - c*g)*(a + b*x)))])/((b*f - a*g)*h) + (3*A^2*B*n*PolyLog[2, 1 +
 ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*A*B
^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x)
)/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (3*B^3*n*Log[(e*(a + b*x)^n)/
(c + d*x)^n]^2*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x
))])/((b*f - a*g)*h) + (6*A*B^2*n^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/
((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*B^3*n^2*Log[(e*(a + b*x)^n)/
(c + d*x)^n]*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))
])/((b*f - a*g)*h) + (6*B^3*n^3*PolyLog[4, 1 + ((b*c - a*d)*(f + g*x))/((d*
f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

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

Rule 31

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

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
```

```
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
 d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{afh+bghx^2+h(bfx+agx)}\,dx = \int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{h(a+bx)(f+gx)}\,dx$$

$$= \frac{\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(f+gx)}\,dx}{h}$$

$$= \frac{\int \left(\frac{A^3}{(a+bx)(f+gx)} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} + \frac{3AB^2\log^2(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} + \frac{B^3\log^3}{}\right.}{h}$$

$$= \frac{A^3\int \frac{1}{(a+bx)(f+gx)}\,dx}{h} + \frac{\left(3A^2B\right)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h} + \frac{\left(3AB^2\right)\int \frac{\log^2(e(}{(a}}{h}$$

$$= -\frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{3AB^2\log^2(e(a+}{}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log(}{(bf-ag)h}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log(}{(bf-ag)h}$$

$$= \frac{A^3\log(a+bx)}{(bf-ag)h} - \frac{A^3\log(f+gx)}{(bf-ag)h} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log(}{(bf-ag)h}$$

Mathematica [F] time = 2.64478, size = 0, normalized size = 0.

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{afh+bghx^2+h(bfx+agx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a*f*h + b*g*h*x^2 + h
*(b*f*x + a*g*x)),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a*f*h + b*g*h*x^2 + h
*(b*f*x + a*g*x)), x]
```

Maple [F] time = 3.54, size = 0, normalized size = 0.

$$\int \frac{1}{afh+bghx^2+h\left(agx+bxf\right)}\left(A+B\ln\left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^3\left(\frac{\log(bx+a)}{(bf-ag)h}-\frac{\log\left(gx+f\right)}{(bf-ag)h}\right)-\int-\frac{B^3\log\left((bx+a)^n\right)^3-B^3\log\left((dx+c)^n\right)^3+B^3\log(e)^3+3\,AB^2\log(e)^2+3\,A^2B\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="maxima")
```

```
[Out] A^3*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - integra
te(-(B^3*log((b*x + a)^n)^3 - B^3*log((d*x + c)^n)^3 + B^3*log(e)^3 + 3*A*B
^2*log(e)^2 + 3*A^2*B*log(e) + 3*(B^3*log(e) + A*B^2)*log((b*x + a)^n)^2 +
3*(B^3*log((b*x + a)^n) + B^3*log(e) + A*B^2)*log((d*x + c)^n)^2 + 3*(B^3*l
og(e)^2 + 2*A*B^2*log(e) + A^2*B)*log((b*x + a)^n) - 3*(B^3*log((b*x + a)^n
)^2 + B^3*log(e)^2 + 2*A*B^2*log(e) + A^2*B + 2*(B^3*log(e) + A*B^2)*log((b
*x + a)^n))*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3+3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^3}{bghx^2+afh+\left(bf+ag\right)hx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="fricas")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(b*g*h*x^2 +
 a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(a*f*h+b*g*h*x**2+h*(a*g*x
+b*f*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{bghx^2+afh+\left(bfx+agx\right)h}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*g*h*x^2 + a*f*h + (b*
f*x + a*g*x)*h), x)
```

3.260 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{afh+bghx^2+h(bfx+agx)}\,dx$

Optimal. Leaf size=203

$$\frac{2Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{h(bf-ag)}+\frac{2B^2n^2\text{PolyLog}\left(3,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-a}{(a+bx)(df-c}\right.}{}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 - ((b*f - a*g)*(c + d*x
))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (2*B*n*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n])*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b
*x))])/((b*f - a*g)*h) + (2*B^2*n^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*
f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rubi [A] time = 0.818899, antiderivative size = 371, normalized size of antiderivative = 1.83, number of steps used = 13, number of rules used = 10, integrand size = 51, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.196, Rules used = {6688, 12, 6742, 36, 31, 2503, 2502, 2315, 2506, 6610}

$$\frac{2ABn\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{2B^2n\log(e(a+bx)^n(c+dx)^{-n})\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{2B^2n^2\text{PolyLog}\left(\right.}{h(bf}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a*f*h + b*g*h*x^2 + h*(b*f*
x + a*g*x)),x]
```

```
[Out] (A^2*Log[a + b*x])/((b*f - a*g)*h) - (A^2*Log[f + g*x])/((b*f - a*g)*h) - (
2*A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*f
- c*g)*(a + b*x)))])/((b*f - a*g)*h) - (B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n
]^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])/((b*f - a*g)*h
) + (2*A*B*n*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))
])/((b*f - a*g)*h) + (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1
 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (2*B
^2*n^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b
*f - a*g)*h)
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
```

```
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

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

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^2}{afh + bghx^2 + h(bfx + agx)}\,dx = \int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^2}{h(a+bx)(f+gx)}\,dx$$

$$= \frac{\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)(f+gx)}\,dx}{h}$$

$$= \frac{\int \left(\frac{A^2}{(a+bx)(f+gx)} + \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} + \frac{B^2\log^2(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\right) dx}{h}$$

$$= \frac{A^2 \int \frac{1}{(a+bx)(f+gx)}\,dx}{h} + \frac{(2AB)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)}\,dx}{h} + \frac{B^2 \int \frac{\log^2(e(a+bx)^n(c+dx)}{(a+bx)(f+gx)}}{h}$$

$$= -\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h} - \frac{B^2\log^2(e(a+bx)^n(c}{(b}$$

$$= \frac{A^2\log(a+bx)}{(bf-ag)h} - \frac{A^2\log(f+gx)}{(bf-ag)h} - \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc}{(df}\right.}{(bf-ag)h}$$

$$= \frac{A^2\log(a+bx)}{(bf-ag)h} - \frac{A^2\log(f+gx)}{(bf-ag)h} - \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log\left(-\frac{(bc}{(df}\right.}{(bf-ag)h}$$

Mathematica [B] time = 0.835137, size = 1415, normalized size = 6.97

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a*f*h + b*g*h*x^2 + h
*(b*f*x + a*g*x)),x]
```

```
[Out] (3*Log[a + b*x]*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*
x)^n)/(c + d*x)^n]))^2 - 3*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log
[(e*(a + b*x)^n)/(c + d*x)^n]))^2*Log[f + g*x] + 3*B*n*(A + B*(-(n*Log[a +
b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n]))*(Log[a + b*x]^2
 - 2*(Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)] + PolyLog[2, (g*(a + b*x)
)/(-(b*f) + a*g)])) - 6*A*B*n*(Log[c + d*x]*(Log[(d*(a + b*x))/(-(b*c) + a*
d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*(c + d*x))/(b*c - a*d
)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + 6*B^2*n*(n*Log[a + b*x] -
n*Log[c + d*x] - Log[(e*(a + b*x)^n)/(c + d*x)^n])*(Log[c + d*x]*(Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[(d*(f + g*x))/(d*f - c*g)]) + PolyLog[2, (b*
(c + d*x))/(b*c - a*d)] - PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)]) + B^2*n
^2*(Log[a + b*x]^2*(Log[a + b*x] - 3*Log[(b*(f + g*x))/(b*f - a*g)]) - 6*Lo
g[a + b*x]*PolyLog[2, (g*(a + b*x))/(-(b*f) + a*g)] + 6*PolyLog[3, (g*(a +
b*x))/(-(b*f) + a*g)]) + 3*B^2*n^2*(Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c
 + d*x]^2 - Log[c + d*x]^2*Log[(d*(f + g*x))/(d*f - c*g)] + 2*Log[c + d*x]*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*Log[c + d*x]*PolyLog[2, (g*(c + d
*x))/(-(d*f) + c*g)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 2*PolyLog[
3, (g*(c + d*x))/(-(d*f) + c*g)]) - 6*B^2*n^2*((Log[a + b*x]^2*(Log[c + d*x
] - Log[(b*(c + d*x))/(b*c - a*d)]))/2 - Log[a + b*x]*Log[c + d*x]*Log[(b*(
f + g*x))/(b*f - a*g)] - (Log[(g*(c + d*x))/(-(d*f) + c*g)]*(-2*Log[a + b*x
] + Log[(g*(c + d*x))/(-(d*f) + c*g)])*(Log[(b*(f + g*x))/(b*f - a*g)] - Lo
g[(d*(f + g*x))/(d*f - c*g)]))/2 + Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((
b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(Log[(b*(f + g*x))/(b*f - a*
g)] - Log[(d*(f + g*x))/(d*f - c*g)]) - (Log[((b*f - a*g)*(c + d*x))/((d*f
- c*g)*(a + b*x))]^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))] + Log[(b*(f + g*x))
/(b*f - a*g)] - Log[((-(b*c) + a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))]))/2
```

```
 - Log[a + b*x]*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - (Log[c + d*x] -
Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(a + b*
x))/(-(b*f) + a*g)] - (Log[a + b*x] + Log[((b*f - a*g)*(c + d*x))/((d*f - c
*g)*(a + b*x))])*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)] - Log[((b*f - a*g
)*(c + d*x))/((d*f - c*g)*(a + b*x))]*(PolyLog[2, (b*(c + d*x))/(d*(a + b*x
))] - PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]) + PolyLo
g[3, (d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[3, (g*(a + b*x))/(-(b*f) + a*g
)] + PolyLog[3, (g*(c + d*x))/(-(d*f) + c*g)] + PolyLog[3, (b*(c + d*x))/(d
*(a + b*x))] - PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])
)/(3*(b*f - a*g)*h)
```

Maple [F] time = 4.911, size = 0, normalized size = 0.

$$\int \frac{1}{afh + bghx^2 + h\left(agx + bxf\right)} \left(A + B\ln\left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A^2\left(\frac{\log(bx+a)}{\left(bf-ag\right)h} - \frac{\log\left(gx+f\right)}{\left(bf-ag\right)h}\right) + \int \frac{B^2\log\left((bx+a)^n\right)^2 + B^2\log\left((dx+c)^n\right)^2 + B^2\log(e)^2 + 2\,AB\log(e) + 2\left(B^2\log\right.}{bghx^2 + af}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="maxima")
```

```
[Out] A^2*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) + integra
te((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^n)^2 + B^2*log(e)^2 + 2*A*B*
log(e) + 2*(B^2*log(e) + A*B)*log((b*x + a)^n) - 2*(B^2*log((b*x + a)^n) +
B^2*log(e) + A*B)*log((d*x + c)^n))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x)
, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^2}{bghx^2 + afh + \left(bf+ag\right)hx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(a*f*h+b*g*h*x**2+h*(a*g*x
+b*f*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{bghx^2+afh+\left(bfx+agx\right)h}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*
f*x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*g*h*x^2 + a*f*h + (b*
f*x + a*g*x)*h), x)
```

3.261 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{afh+bghx^2+h(bfx+agx)}\,dx$

Optimal. Leaf size=123

$$\frac{Bn\text{PolyLog}\left(2,\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}-\frac{\log\left(1-\frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h(bf-ag)}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - ((b*f - a*g)*(c + d*x))
/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)) + (B*n*PolyLog[2, ((b*f - a*g)*
(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rubi [A] time = 0.393844, antiderivative size = 163, normalized size of antiderivative = 1.33, number of steps used = 10, number of rules used = 8, integrand size = 49, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.163, Rules used = {6688, 12, 6742, 36, 31, 2503, 2502, 2315}

$$\frac{Bn\text{PolyLog}\left(2,\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}+1\right)}{h(bf-ag)}+\frac{A\log(a+bx)}{h(bf-ag)}-\frac{A\log(f+gx)}{h(bf-ag)}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a*f*h + b*g*h*x^2 + h*(b*f*x
+ a*g*x)),x]
```

```
[Out] (A*Log[a + b*x])/((b*f - a*g)*h) - (A*Log[f + g*x])/((b*f - a*g)*h) - (B*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(
a + b*x)))])/((b*f - a*g)*h) + (B*n*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/
((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

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

Rule 31

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

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{afh+bghx^2+h(bfx+agx)}\,dx &= \int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h(a+bx)(f+gx)}\,dx\\
&= \frac{\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\,dx}{h}\\
&= \frac{\int \left(\frac{A}{(a+bx)(f+gx)}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\right)dx}{h}\\
&= \frac{A\int \frac{1}{(a+bx)(f+gx)}\,dx}{h}+\frac{B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(f+gx)}\,dx}{h}\\
&= -\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}+\frac{(Ab)\int \frac{1}{a+bx}\,dx}{(bf-ag)h}-\frac{(Ag)\int \frac{}{f+}}{(bf-a}\\
&= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx}{(df-cg)(a+bx}\right.}{(bf-ag)h}\\
&= \frac{A\log(a+bx)}{(bf-ag)h}-\frac{A\log(f+gx)}{(bf-ag)h}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log\left(-\frac{(bc-ad)(f+gx}{(df-cg)(a+bx}\right.}{(bf-ag)h}
\end{aligned}
$$

Mathematica [B] time = 0.257613, size = 303, normalized size = 2.46

$$
-\frac{2Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+2Bn\text{PolyLog}\left(2,\frac{g(a+bx)}{ag-bf}\right)-2Bn\text{PolyLog}\left(2,\frac{g(c+dx)}{cg-df}\right)-2A\log(a+bx)+2B\log(f+gx)\log}{}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a*f*h + b*g*h*x^2 + h*(
b*f*x + a*g*x)),x]
```

```
[Out] -((-2*A*Log[a + b*x] + B*n*Log[a + b*x]^2 - 2*B*n*Log[a + b*x]*Log[c + d*x]
 + 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] - 2*B*Log[a + b*x]*
Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*A*Log[f + g*x] - 2*B*n*Log[a + b*x]*Lo
g[f + g*x] + 2*B*n*Log[c + d*x]*Log[f + g*x] + 2*B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*Log[f + g*x] + 2*B*n*Log[a + b*x]*Log[(b*(f + g*x))/(b*f - a*g)] -
 2*B*n*Log[c + d*x]*Log[(d*(f + g*x))/(d*f - c*g)] + 2*B*n*PolyLog[2, (g*(a
 + b*x))/(-(b*f) + a*g)] + 2*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*
B*n*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)])/((2*b*f - 2*a*g)*h))
```

Maple [C] time = 0.711, size = 1447, normalized size = 11.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x)
```

```
[Out] B/h*n/(a*g-b*f)*dilog((d*(g*x+f)+c*g-d*f)/(c*g-d*f))-B/h*n/(a*g-b*f)*dilog(
(-a*d+b*c+d*(b*x+a))/(-a*d+b*c))+1/h/(a*g-b*f)*ln(g*x+f)*B*ln(e)-1/h/(a*g-b
*f)*ln(b*x+a)*B*ln(e)+1/h*B/(a*g-b*f)*ln(g*x+f)*ln((b*x+a)^n)-1/h*B*n/(a*g-
b*f)*ln(g*x+f)*ln((b*(g*x+f)+a*g-b*f)/(a*g-b*f))+B/h*n/(a*g-b*f)*ln(g*x+f)*
ln((d*(g*x+f)+c*g-d*f)/(c*g-d*f))-B/h*n/(a*g-b*f)*ln(b*x+a)*ln((-a*d+b*c+d*
(b*x+a))/(-a*d+b*c))-B/h*ln((d*x+c)^n)/(a*g-b*f)*ln(g*x+f)+B/h*ln((d*x+c)^n
)/(a*g-b*f)*ln(b*x+a)-1/h*B*ln((b*x+a)^n)/(a*g-b*f)*ln(b*x+a)+1/2*I/h/(a*g-
b*f)*ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)-1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^
n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/h*A/(a*g-b*f)*ln(b*x+a)+1/
h*A/(a*g-b*f)*ln(g*x+f)+1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/h/(a*g-b*f)*ln(b*x+
a)*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g-b*f)*ln(g*
x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1
/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+
c)^n))^2-1/h*B*n/(a*g-b*f)*dilog((b*(g*x+f)+a*g-b*f)/(a*g-b*f))+1/2/h*B*n/(
a*g-b*f)*ln(b*x+a)^2+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e)*csg
n(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-b*f)*ln(b
*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b
*f)*ln(g*x+f)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*
I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I/h/(a*g
-b*f)*ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I/h/(a*g-b*f)*ln(g
*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^
n))-1/2*I/h/(a*g-b*f)*ln(g*x+f)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*
I/h/(a*g-b*f)*ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$A\left(\frac{\log\left(bx+a\right)}{\left(bf-ag\right)h}-\frac{\log\left(gx+f\right)}{\left(bf-ag\right)h}\right)-B\int-\frac{\log\left(\left(bx+a\right)^{n}\right)-\log\left(\left(dx+c\right)^{n}\right)+\log\left(e\right)}{bghx^{2}+afh+\left(bfh+agh\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*
x)),x, algorithm="maxima")
```

```
[Out] A*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - B*integra
te(-(log((b*x + a)^n) - log((d*x + c)^n) + log(e))/(b*g*h*x^2 + a*f*h + (b*
f*h + a*g*h)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{bghx^2+afh+\left(bf+ag\right)hx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*
x)),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f +
 a*g)*h*x), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(a*f*h+b*g*h*x**2+h*(a*g*x+b*
f*x)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{bghx^2+afh+\left(bfx+agx\right)h}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*
x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f*
x + a*g*x)*h), x)
```

3.262 $\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=82

$$\frac{\text{Subst}\left(\text{Unintegrable}\left(\frac{1}{(a+bx)(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)}{h}$$

```
[Out] Defer[Subst][Unintegrable[1/((a + b*x)*(f + g*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*x)^n]/
h
```

Rubi [A] time = 0.430517, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x)^n)/(
c + d*x)^n])),x]
```

```
[Out] (b*Defer[Int][1/((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x])/(
(b*f - a*g)*h) - (g*Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n])), x])/((b*f - a*g)*h)
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx &= \int \frac{1}{h(a+bx)(f+gx)(A+B\log(e(a+bx)^n\\
&= \frac{\int \frac{1}{(a+bx)(f+gx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx}{h}\\
&= \frac{\int \left(\frac{b}{(bf-ag)(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))} - \frac{}{(bf-}\right.}{h}\\
&= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx}{(bf-ag)h} - \frac{g\int \frac{}{(}}{}
\end{aligned}$$

Mathematica [A] time = 0.132721, size = 0, normalized size = 0.

$$\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])),x]
```

```
[Out] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])), x]
```

Maple [A] time = 12.227, size = 0, normalized size = 0.

$$\int \frac{1}{afh+bghx^2+h\left(agx+bxf\right)}\left(A+B\ln\left(\frac{e\left(bx+a\right)^n}{\left(dx+c\right)^n}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x
)
```

```
[Out] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x
)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bghx^2+afh+\left(bfx+agx\right)h\right)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n))),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h)*(B*log((b*x + a)^n*e/(
d*x + c)^n) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Abghx^2+Aafh+\left(Abf+Aag\right)hx+\left(Bbghx^2+Bafh+\left(Bbf+Bag\right)hx\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*b*g*h*x^2 + A*a*f*h + (A*b*f + A*a*g)*h*x + (B*b*g*h*x^2 + B*
a*f*h + (B*b*f + B*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x**2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)**n/((d*x+c
)**n))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bghx^2 + afh + \left(bfx + agx\right)h\right)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h)*(B*log((b*x + a)^n*e/(
d*x + c)^n) + A)), x)
```

3.263 $\int \frac{1}{\left(afh+bghx^2+h(bfx+agx)\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$

Optimal. Leaf size=82

$$\frac{\text{Subst}\left(\text{Unintegrable}\left(\frac{1}{(a+bx)(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right),e\left(\frac{a+bx}{c+dx}\right)^n,e(a+bx)^n(c+dx)^{-n}\right)}{h}$$

```
[Out] Defer[Subst][Unintegrable[1/((a + b*x)*(f + g*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n])^2), x], e*((a + b*x)/(c + d*x))^n, (e*(a + b*x)^n)/(c + d*x)^n
]/h
```

Rubi [A] time = 0.459884, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(afh+bghx^2+h(bfx+agx)\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x)^n)/(
c + d*x)^n])^2),x]
```

```
[Out] (b*Defer[Int][1/((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2), x])
/((b*f - a*g)*h) - (g*Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])^2), x])/((b*f - a*g)*h)
```

Rubi steps

$$\int \frac{1}{\left(afh+bghx^2+h(bfx+agx)\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx = \int \frac{1}{h(a+bx)(f+gx)\left(A+B\log\left(e(a+bx)^n(c\right.\right.}$$
$$= \frac{\int \frac{1}{(a+bx)(f+gx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx}{h}$$
$$= \frac{\int \left(\frac{b}{(bf-ag)(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2} - \frac{}{(bf-a}\right.}{h}$$
$$= \frac{b\int \frac{1}{(a+bx)(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}\,dx}{(bf-ag)h} - \frac{g\int \frac{}{(f+}}{}$$

Mathematica [A] time = 0.268337, size = 0, normalized size = 0.

$$\int \frac{1}{\left(afh+bghx^2+h(bfx+agx)\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])^2),x]
```

```
[Out] Integrate[1/((a*f*h + b*g*h*x^2 + h*(b*f*x + a*g*x))*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])^2), x]
```

Maple [A] time = 4.622, size = 0, normalized size = 0.

$$\int \frac{1}{afh + bghx^2 + h\left(agx + bxf\right)}\left(A + B\ln\left(\frac{e\left(bx + a\right)^n}{\left(dx + c\right)^n}\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2
,x)
```

```
[Out] int(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2
,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\left(df - cg\right)\int \frac{}{\left(bcf^2hn - adf^2hn\right)AB + \left(bcf^2hn\log\left(e\right) - adf^2hn\log\left(e\right)\right)B^2 + \left(\left(bcg^2hn - adg^2hn\right)AB + \left(bcg^2hn\log\left(e\right)\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n)))^2,x, algorithm="maxima")
```

```
[Out] (d*f - c*g)*integrate(1/((b*c*f^2*h*n - a*d*f^2*h*n)*A*B + (b*c*f^2*h*n*log
(e) - a*d*f^2*h*n*log(e))*B^2 + ((b*c*g^2*h*n - a*d*g^2*h*n)*A*B + (b*c*g^2
*h*n*log(e) - a*d*g^2*h*n*log(e))*B^2)*x^2 + 2*((b*c*f*g*h*n - a*d*f*g*h*n)
*A*B + (b*c*f*g*h*n*log(e) - a*d*f*g*h*n*log(e))*B^2)*x + ((b*c*g^2*h*n - a
*d*g^2*h*n)*B^2*x^2 + 2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*c*f^2*h*n -
a*d*f^2*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g^2*h*n - a*d*g^2*h*n)*B^2*x^2 +
 2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*c*f^2*h*n - a*d*f^2*h*n)*B^2)*log
((d*x + c)^n)), x) - (d*x + c)/((b*c*f*h*n - a*d*f*h*n)*A*B + (b*c*f*h*n*lo
g(e) - a*d*f*h*n*log(e))*B^2 + ((b*c*g*h*n - a*d*g*h*n)*A*B + (b*c*g*h*n*lo
g(e) - a*d*g*h*n*log(e))*B^2)*x + ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b*c*f*h
*n - a*d*f*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b
*c*f*h*n - a*d*f*h*n)*B^2)*log((d*x + c)^n))
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2bghx^2 + A^2afh + \left(A^2bf + A^2ag\right)hx + \left(B^2bghx^2 + B^2afh + \left(B^2bf + B^2ag\right)hx\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\left(ABbg\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*b*g*h*x^2 + A^2*a*f*h + (A^2*b*f + A^2*a*g)*h*x + (B^2*b*g*
h*x^2 + B^2*a*f*h + (B^2*b*f + B^2*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*b*g*h*x^2 + A*B*a*f*h + (A*B*b*f + A*B*a*g)*h*x)*log((b*x + a)^
n*e/(d*x + c)^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x**2+h*(a*g*x+b*f*x))/(A+B*ln(e*(b*x+a)**n/((d*x+c
)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bghx^2 + afh + \left(bfx + agx\right)h\right)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x))/(A+B*log(e*(b*x+a)^n/((d*x+c)
^n)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h)*(B*log((b*x + a)^n*e/(
d*x + c)^n) + A)^2), x)
```

Chapter 4

Listing of Grading functions

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

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

The following are links to the current source code.

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

4.0.1 Mathematica and Rubi grading function

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

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


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


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


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
```

```
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


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


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


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


```

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

4.0.2 Maple grading function

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

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

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

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

      leaf_count_optimal:=leafcount(optimal);

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

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

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

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


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


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
```

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

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

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

ExpnType := proc(expn)
```

```
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


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

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

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

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

```
end proc:

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

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

4.0.3 Sympy grading function

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

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

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

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

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

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

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

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

```
        else:
           return False

    except AttributeError as error:
        return False

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

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
```

```
    leaf_count_optimal = leaf_count(optimal)

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

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

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

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

def tree(expr):
    debug=False;
    if debug:
         print ("Enter tree(expr), expr=",expr)
         print ("expr.operator()=",expr.operator())
         print ("expr.operands()=",expr.operands())
         print ("map(tree, expr.operands()=",map(tree, expr.operands()))

    if expr.operator() is None:
        return expr
    else:
        return [expr.operator()]+list(map(tree, expr.operands()))

def leaf_count(anti):
    debug=False;

    if debug: print ("Enter leaf_count, anti=", anti, " len(anti)=", len(anti))

    if len(anti) == 0: #special check for optimal being 0 for some test cases.
       if debug: print ("len(anti) == 0")
       return 1
    else:
        if debug: print ("round(1.35*len(flatten(tree(anti))))=",round(1.35*len
    (flatten(tree(anti)))))
        return round(1.35*len(flatten(tree(anti)))) #fudge factor
                         #since this estimate of leaf count is bit lower than
```

```
                      #what it should be compared to Mathematica's

def is_sqrt(expr):
    debug=False;
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug = False

    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug = False

    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath

```

```
def is_atom(expn):

    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):
    debug=False

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
```

```
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): # is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):
    debug = False;

    if debug: print ("Enter grade_antiderivative for sagemath")

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

    if debug: print ("leaf_count_result=", leaf_count_result, " leaf_count_optimal=",leaf_count_optimal)


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

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=", expnType_optimal)

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